Routing Study and Environmental Report

for the

Darlington County Plant - Florence 230-kV Transmission Line Project

December 2002

Prepared for

CP&L

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Burns & McDonnell

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ROUTING STUDY AND ENVIRONMENTAL REPORT
for the
DARLINGTON COUNTY PLANT-FLORENCE TRANSMISSION LINE PROJECT

for
CAROLINA POWER & LIGHT

December 2002
Project: 29330

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1.0 Introduction

2.0 Project Description

2.0 PROJECT DESCRIPTION

2.1 OVERVIEW

CP&L proposes to construct a new 230-kV transmission line to meet the growing demand for power by the citizens, businesses and industries of the Pee Dee Region.

2.2 DESCRIPTION OF THE PROJECT

The project consists of the construction of approximately 37 miles of new 230-kV transmission line between the Darlington County Plant and the existing Florence Substation. The proposed transmission line will be owned and operated by CP&L. Two routes, a preferred and alternate, have been identified between the Darlington County Plant and the Florence Substation. These options are described in Chapter 4.0.

2.2.1 Purpose and Necessity

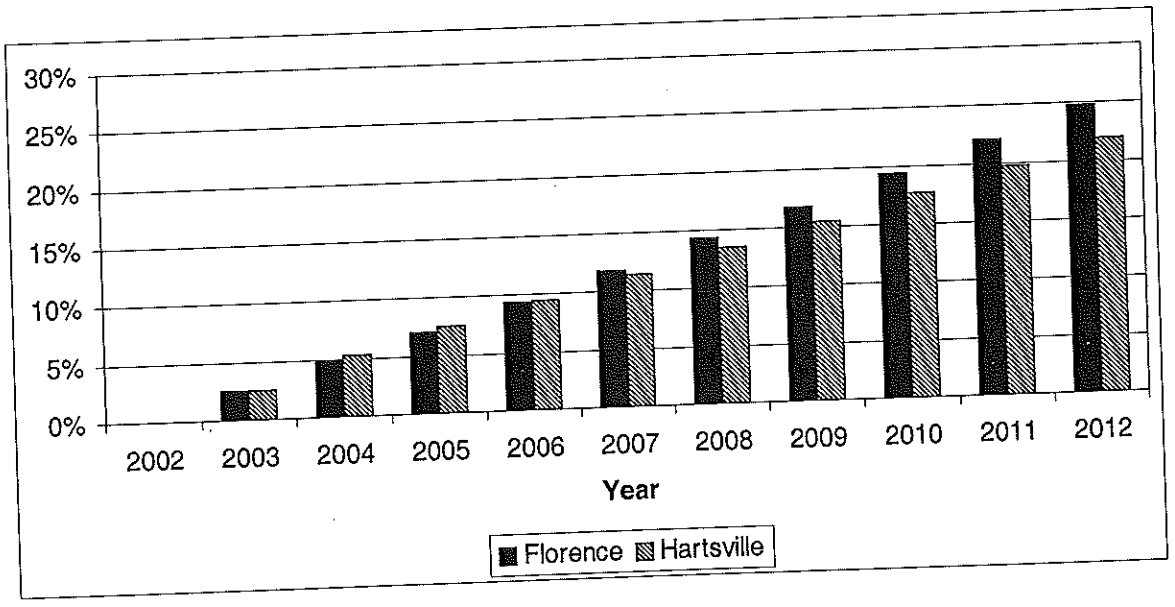
CP&L's continuous assessment of electric system requirements has identified the need for this transmission project – one of several planned or under way in CP&L's service territory – to help ensure a continued reliable supply of electric service to homes and businesses. Projected electric load in the Darlington County / Florence area is expected to exceed system capability under peak contingency conditions (discussed below) by mid-2005. Additional constraints on the existing electric transmission system in the area, coupled with significant customer growth in both population and electric usage, have prompted the need for CP&L to upgrade its transmission facilities.

CP&L's transmission planning criteria calls for studies to be performed to assess the impact of numerous potential contingencies, including the outage of certain major generating plants and transmission lines. One of these studies examined the impact of an outage of CP&L's Brunswick Plant, located near Wilmington, North Carolina, coupled with one of the major transmission lines in the Pee Dee Region being out of service. From the studies performed it was determined that during an outage of the Brunswick Plant, if the Robinson-Florence 230-kV line is opened (i.e., not transmitting electricity), the Robinson-South Carolina Public Service Authority (SCPSA) Darlington 230-kV line will overload and exceed its rated capacity by Summer, 2005. If the Robinson-SCPSA Darlington 230-kV line were to then trip due to overloading, the Kingstree-SCPSA Kingstree 230-kV line, the Florence-Kingstree 230-kV line, and the Robinson-Florence 115-kV line would all overload. It was also determined that, under the

same pre-contingency system condition described above, if the Robinson-SCPSA Darlington 230-kV line is opened instead, the Robinson-Florence 115-kV line will also overload in 2005. If the Robinson-Florence 115-kV line is opened, the Robinson-Florence 230-kV line will then overload. If any of these lines were to trip due to overloading, all of the substations served from the lines could experience extended outages, resulting in loss of power to customers served from these substations. Overloading of the existing transmission lines would limit the capability of these lines to move power from the Robinson and Darlington County Plants, requiring a reduction in output at those generating plants and impairing CP&L's ability to provide reliable service. This project will reduce these contingency loadings to acceptable values, allowing the Robinson / Darlington County generation complex to operate at full output.

Customer growth in population and electric usage is expected to place greater demands on the distribution and transmission systems in the Florence and Hartsville areas. Load growth is projected to increase approximately two to three percent each year for the next ten years (Figure 2-1).

Figure 2-1
Projected Load Growth by Operations Center



Continued load growth in the area over time decreases the transmission line electrical capacity available to transfer power from CP&L's Robinson and Darlington County Generating Plants to North-Eastern South Carolina and South-Eastern North Carolina. This project will reduce contingency loadings on the existing transmission lines to acceptable levels, allowing the Robinson Plant and Darlington County Plant

generation complex to operate at full output to help CP&L meet customer demands for electricity in the region. This project would also improve the power quality and reliability in the area, and reduce the frequency and duration of potential power outages. Without the transmission system upgrades, load in the area would exceed the electric system capability in the near future. An additional benefit of the project would be continued economic growth in the region through the generation of an estimated $87,000 in additional annual property tax revenue for local governments.

2.2.2 Location

The project study area is primarily located in Darlington County, but also includes northern Florence County and a small portion of northeastern Lee County. Darlington, Florence, and Lee counties are located in northeast South Carolina, approximately 70 miles east of Columbia. The primary communities in the area include Florence, Darlington, Hartsville, and North Hartsville CDP (Census Designated Place - a high concentration of population that is not located within an incorporated place but locally identified by name (U.S. Census Bureau, 2002)). These communities and the regional area are shown in Figure 2-2.

The origin of the new transmission line would be the Darlington County Plant, located along the western shore of Lake Robinson, northwest of Hartsville. The terminus of the new line would be the Florence Substation, located in northern Florence near Douglas Street, just north of Vista Street.

The preferred route (detailed discussion of preferred route included in Chapter 5.0) would exit the Darlington County Plant to the west heading toward the boundary of Darlington County and Chesterfield County. The preferred route would turn south, then southeast near the boundary of Darlington County and Lee County, paralleling a gas pipeline through a small portion of northeast Lee County. The preferred route crosses back into Darlington County and after crossing State Route (S.C.) 403, heads east, eventually crossing U.S. Highway 401. After crossing this highway, the preferred route parallels an existing transmission line heading east. Near Ebenezer Road, the preferred route turns northeast, across U.S. Highway 52 paralleling an existing Santee-Cooper transmission line. The route would then turn back southeast crossing into Florence County. The preferred route would then turn east, paralleling another existing transmission line along the Darlington County / Florence County line. After crossing Interstate 95, the preferred route would angle south heading into the Florence Substation parallel to another CP&L transmission line (Figure 2-3).

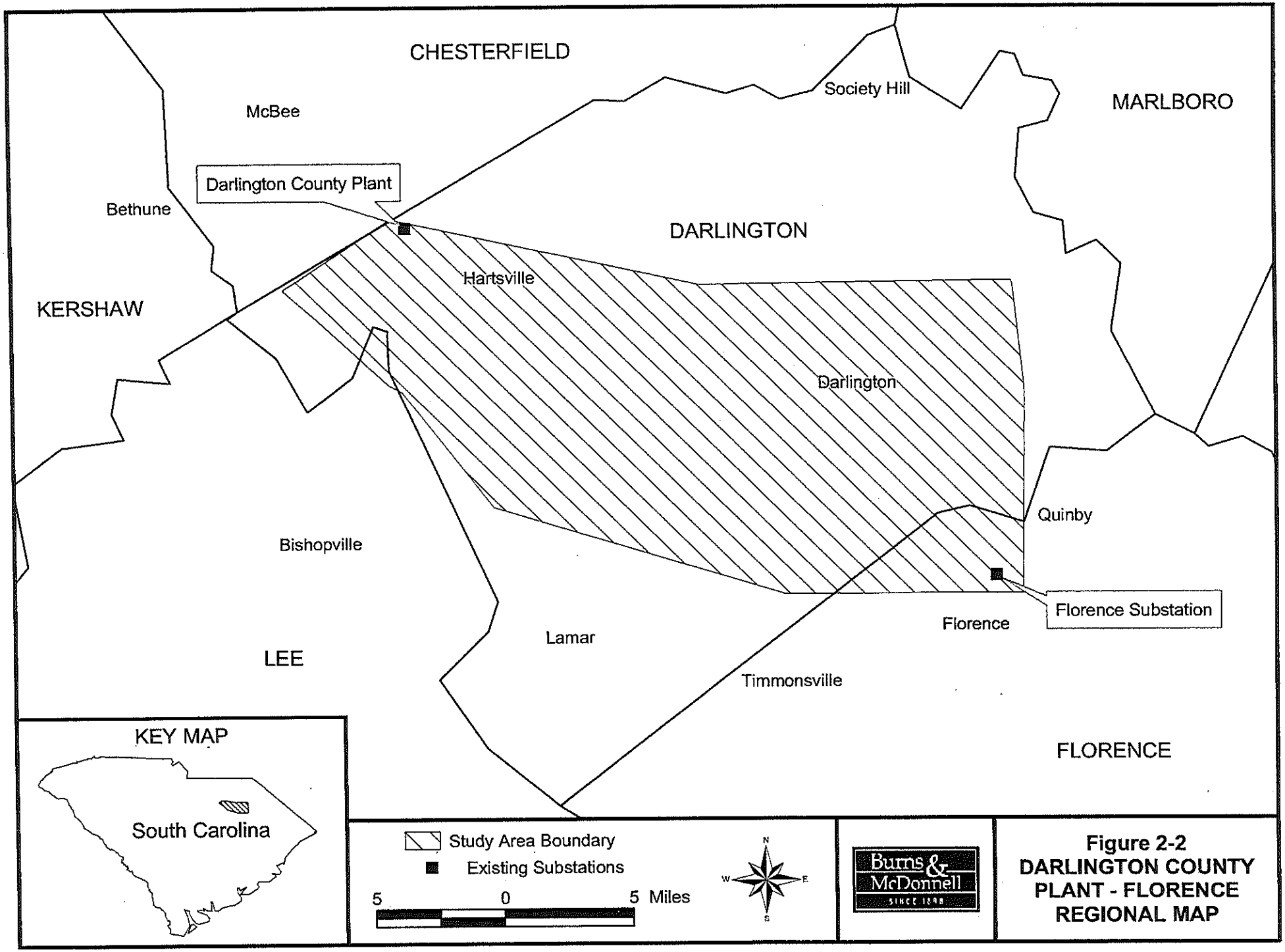


Figure 2-2
DARLINGTON COUNTY PLANT - FLORENCE REGIONAL MAP

2.3 CONSTRUCTION, OPERATION, AND MAINTENANCE

The transmission line would be constructed in several phases using both rubber-tired and tracked equipment. The appropriate materials would be delivered to each structure location for assembly. Holes for each pole would be dug with an auger and the poles would be erected using a crane. The poles would be buried directly into the ground. Excess soil from the holes would be evenly distributed around each pole and the soil stabilized. In wetland areas, the method used for the installation of poles would depend on the nature of the sub-surface conditions. Under most circumstances, the poles would be buried directly into the ground. However, if poor sub-surface soil conditions are encountered, steel caissons may be necessary. The steel caissons would be vibrated into the ground and the poles would be set on top of the steel caisson. Conductors would be pulled through each structure using tensioning equipment.

Maintaining the rights-of-way under transmission lines is essential for the reliable operation of the line and public safety. Operation and maintenance of the line would consist of periodic inspections of the line and right-of-way, replacement of hardware as necessary, and periodic removal of tall vegetation within the corridor and danger trees. Danger trees are outside the cleared corridor, but are sufficiently tall to potentially impact the transmission line should the trees fall into the right-of-way. The periodic inspections would occur on a regular basis and utilize both aircraft and walking patrols. Normal operation and maintenance would require only infrequent visits by CP&L or their contractors.

CP&L would use an Integrated Vegetation Management approach that includes both mechanical and chemical control methods to maintain the right-of-way. Most maintenance activities consist of mowing or hand-cutting the entire right-of-way every three years and cutting danger trees approximately every seven to nine years. Herbicides would be used on a very limited basis and are applied at low volumes approximately every five years. CP&L only uses herbicides approved for use on power line rights-of-way by the U.S. Environmental Protection Agency (EPA).

2.4 PROJECT SCHEDULE

The projected schedule for the Darlington County Plant-Florence transmission line is described below:

- Route Selection: Summer, 2002
- Right-of-Way Acquisition: January, 2003 - Spring, 2004
- Clearing: Fall, 2003 - Spring, 2004
- Construction: Spring, 2004 - Spring, 2005
- In-Service Date: Summer, 2005

2.5 PROJECT COST

The total cost budgeted for this transmission line project is $24,000,000. This includes company labor, contract labor, right-of-way acquisition, materials, clearing, construction, project administration, overhead, and taxes.

adjacent to streams. The Wagram-Lakeland-Norfolk Association comprises approximately 11 percent of the soils in Florence County. Land-use on this association is agriculture and woodland. The Wehadkee-Johnston Association consists of poorly drained soils on flood plains of streams in Florence County. These soils occupy only a small percentage of the soils in Florence County, and are primarily wooded. The Wehadkee-Johnston Association is typically not suitable for cultivation (Pitts, 1974).

The five soil associations in Darlington County include: Norfolk-Coxville Association, Norfolk-Dunbar-Coxville Association, Wehadkee-Okenee Association, Lakeland-Vaucluse-Gilead Association, and the Coxville-Rutlege Association. A majority of the study area in Darlington County is within the Norfolk-Coxville Association (Colburn, 1960; Morton, 2000).

The Norfolk-Coxville Association consists of well drained soils on the broad, nearly level plains (Norfolk soils) and poorly drained soils in lower, depressed areas (Coxville soils). Hartsville and Darlington, the largest cities in Darlington County, are located on Norfork-Coxville soils. A large majority of the crop agriculture in Darlington County is found on Norfolk soils. These soils are also well suited for woodland production and pastures. Drainage for soils of the Norfolk-Dunbar-Coxville Association ranges from well drained to poorly drained. These soils typically occupy level sites, but can be found along steep slopes adjacent to streams. Most of the area covered by these soils is farmed or used for livestock. The Wehadkee-Okenee Association are poorly drained soils found along the plains of Black Creek. These soils are frequently flooded and are primarily forested. The Lakeland-Vaucluse-Gilead Association consists of level to sloping soils found on hilltops, steep hillsides, and foot slopes. These soils are also primarily forested. The Coxville-Rutlege Association consists of poorly drained, level soils. Very little acreage of these soils has been cleared and farmed (Colburn 1960; Morton 2000).

The study area also includes a small portion of northeast Lee County, which borders Darlington County (see Figure 3-1). The two soil surveys of Lee County, dated 1907 and 1963, are out-of-print and no longer available for distribution (U.S. Department of Agriculture-Natural Resources Conservation Service Soil Survey Division, 2002). The soils in this portion of Lee County included in the study area are assumed to be similar to the soils found in northwestern Darlington County.

3.2.3 Hydrology

The study area is generally bound by the Lynches River to the west and the Great Pee Dee River to the east. Both rivers drain southeast and flow together south of the study area. The study area is situated within the Lynches River Basin and Pee Dee River Basin, which together, along with the Black River

Basin and Little Pee Dee River Basin form the Pee Dee watershed basin (South Carolina Department of Health and Environmental Control, Bureau of Water, Watershed Management, 2002). Two lakes are located within the study area. Lake H.B. Robinson, north of Hartsville, is a man-made lake owned and operated by CP&L for their nuclear plant. Lake H.B. Robinson impounds Black Creek, forming a 2,250-acre water body (South Carolina Department of Health and Environmental Control, Bureau of Water, 2001). Prestwood Lake, located between Hartsville and the Segars-McKinnon Heritage Preserve, impounds the Black Creek west of U.S. Highway 15 (DeLorme, 1998). Other water courses within the study area include Bellyache Creek, Beaverdam Creek, Jefferies Creek, Swift Creek, High Hill Creek, Everlasting Branch, and Steer Fork Branch.

Groundwater represents greater than 50 percent of the water supply for residents and industry in South Carolina (South Carolina Department of Health and Environmental Control, Bureau of Water, 2001). Groundwater within Florence and Darlington counties occurs in sand and limestone aquifers characteristic of the Coastal Plain. The amount of water stored in these aquifers in the Coastal Plain is greatest in the south, and decreases north toward the border with North Carolina. Public water sources for both Darlington and Florence counties rely almost exclusively on groundwater. Residents not supplied by public water systems rely on private wells (Florence Municipal/County Planning Department, 1997). The City of Florence has one of the largest water supply systems in the State of South Carolina supplied only by wells. This has resulted in declines in the water level in the aquifers in the Florence area (Cherry and Badr, 1998).

3.2.4 Vegetation

The study area is located in eastern South Carolina in the Coastal Plains physiographic region. This physiographic region is dominated by southeastern evergreen forests. The species composition of these forests was historically and still is influenced by disturbances such as fire and hurricanes. The impacts of Hurricane Hugo on South Carolina forests are still evident today, and will be for many years to come. Forests in Florence and Darlington counties received light to moderate damage from Hurricane Hugo (Connor, 1998). Agriculture has also profoundly influenced southeastern evergreen forests through land clearing. As cultivated lands were vacated in the late 19th century, pines such as loblolly pine (*Pinus taeda*) and shortleaf pine (*P. taeda*) established themselves in the abandoned fields (Barnes, 1991).

Approximately 66 percent of South Carolina is forested. Almost half of the forest is dominated by softwoods, such as loblolly pine, shortleaf pine, longleaf pine (*P. palustris*), slash pine (*P. elliotii*), and bald cypress (*Taxodium distichum*). Loblolly pine is the dominant tree species in these forests,

comprising approximately 12 percent of the softwood forests. Approximately half of the softwood forests consist of pine plantations. Areas of longleaf pine have been declining over the past three centuries (Connor, 1998).

Nelson (1986) identified 49 natural communities within the coastal plains physiographic region in South Carolina. Twenty-three of these communities are found along the Atlantic Coast in the outer coastal plain, east of the study area. Natural communities common within the coastal plain and most likely to be found within the study area include: bottomland hardwoods, depression meadows, hillside herb bogs, levees, mesic mixed hardwood forests, non-alluvial swamp forests, oak-hickory forests, pine flatwoods, pocosin, pond cypress pond, pond cypress savannah, pond pine woodland, swamp tupelo pond, upland pine-wiregrass woodland, and xeric sandhill scrub (Nelson, 1986).

Some of the common tree species within Florence and Darlington counties include: yellow poplar (*Liriodendron tulipifera*), sweetgum (*Liquidambar styraciflua*), American sycamore (*Planatus occidentalis*), cottonwood (*Populus deltoides*), water tupelo (*Nyssa aquatica*), blackgum (*N. sylvatica*), black walnut (*Juglans nigra*), magnolia (*Magnolia* spp.), green ash (*Fraxinus pennsylvanica*), hackberry (*Celtis occidentalis*), and various species of maples (*Acer* spp.). Various species of oaks (*Quercus* spp.) are also present, including white oak (*Q. alba*), post oak (*Q. stellata*), southern red oak (*Q. falcata*), chestnut oak (*Q. prinus*), swamp chestnut oak (*Q. michauxii*), water oak (*Q. nigra*), willow oak (*Q. phellos*), and shumard oak (*Q. shumardii*). Species of cypress may be found in lowlands, including pond cypress (*Taxodium ascendens*) and bald cypress (Pitts, 1974; Nelson, 1986; Preston, 1989; Connor, 1998; U.S. Department of Agriculture, Natural Resource Conservation Service, 2001).

Shrubs and vines that may occur in Darlington and Florence counties include: southern arrowwood (*Viburnum dentatum*), blackhaw (*V. prunifolium*), common persimmon (*Diospyros virginiana*), strawberry bush (*Euonymus americana*), blueberry (*Vaccinium* spp.), trumpet creeper (*Campsis radicans*), poison ivy (*Toxicodendron radicans*), summer grape (*Vitis aestivalis*), milkvine (*Matelea* spp.), and woodvamp (*Decumaria barbara*) (Nelson, 1986; U.S. Department of Agriculture, Natural Resource Conservation Service, 2001),

Herbaceous plants likely to be found in Darlington and Florence counties include: Virginia dayflower (*Commelina virginiana*), nodding ladies'-tresses (*Spiranthes cernua*), violets (*Viola* spp.), butterweed (*Senecio glabellus*), wingleaf primrose-willow (*Ludwigia decurrens*), jumpseed (*Polygonum virginianum*), aster (*Aster* spp.), and swamp sunflower (*Helianthus angustifolius*). Ferns likely to be

found include royal fern (*Osmunda regalis*), cinnamon fern (*O. cinnamonea*), and western brackenfern (*Pteridium aquilinum*). Panicgrass species (*Panicum* spp.), as well as sedges (*Carex* spp.) and rushes (*Juncus* spp.) may also be common. Bluegrass (*Andropogon* spp.), threeawn (*Aristida* spp.), and meadowbeauty (*Rhexia* spp.) are common in pine flatwood communities (Nelson, 1986; U.S. Department of Agriculture, Natural Resource Conservation Service, 2001).

The study area also includes one known natural area, the Segars-McKinnon Heritage Preserve. The Segars-McKinnon Heritage Preserve is located west of downtown Hartsville along the north side of Black Creek.

3.2.5 Threatened and Endangered Plant Species

Information available from the U.S. Fish and Wildlife Service (USFWS) listed federally threatened and endangered plant species that occur within Darlington, Florence, and Lee counties. Three plant species that occur within Darlington and Florence counties are listed as federally endangered. Table 3-1 shows these species by county, listing their state and federal status. The USFWS listed no proposed or candidate plant species within these counties.

Table 3-1
Threatened and Endangered Plants by County

Common Name	Scientific Name	County	State Status	Federal Status
Rough-leaved loosestrife	*Lysimachia asperulifolia*	Darlington[1]	Endangered	Endangered
Canby's dropwort	*Oxypolis canbyi*	Florence[2] Lee[1]	Endangered	Endangered
American chaffseed	*Schwalbea americana*	Florence[1] Lee[1]	Endangered	Endangered

Endangered - A taxon "in danger of extinction throughout all or a significant portion of its range."
1 U.S.Fish and Wildlife Service, Southeastern Region Ecological Services (1999)
2 South Caroina Department of Natural Resources, Wildlife and Freshwater Fisheries Division (2002)

The South Carolina Department of Natural Resources (SCDNR) Heritage Trust Program (HTP) maintains a database that identifies occurrences of threatened and endangered species, as well as species of concern by county or USGS Quadrangle. The database was used to identify known occurrences of threatened and endangered species within the study area. This search revealed that two species critically imperiled state-wide, spring flowering goldenrod (*Solidago verna*) and white-wicky (*Kalmia cuneata*), have been identified within the study area by the SCDNR HTP. Five state plant species of concern have been

identified by the SCDNR HTP to occur within the study area. These species are: sarvis holly (*Ilex amelanchier*), southeastern sneezeweed (*Helenium pinnatifidum*), spinulose wood-fern (*Dryopteris spinulosa*), climbing fern (*Lygodium palmatum*), and twig rush (*Cladium mariscoides*) (South Carolina Heritage Trust, 2002).

3.2.6 Wetlands

There are approximately 4.5 million acres of wetlands in South Carolina, which account for approximately 12 percent of the wetlands in the southeastern United States. Approximately 95 percent of the wetlands in South Carolina are found in the Coastal Plains physiographic region. A vast majority of South Carolina wetlands are freshwater wetlands and approximately 2.9 million acres, or 64 percent of South Carolina's wetlands, are forested (Brown, 1997; South Carolina Department of Health and Environmental Resources, Bureau of Water, 2002). Most of these forested wetlands in South Carolina are in non-industrial, private ownership (Brown, 1997).

Carolina bays are an isolated wetland characteristic of North and South Carolina and Georgia, but can be found all along the Atlantic Coast from Florida to Delaware. Carolina bays are common in the study area in Darlington and Florence counties, based on USGS topographic maps. Carolina bays are shallow depressions largely fed by rain and groundwater, and host a diverse community of plant and animal species (University of Georgia, Savannah River Ecology Laboratory, 2001).

Based on USFWS National Wetland Inventory (NWI) maps, there are eight distinctive types of wetlands found within the study area. These wetlands fall into three broad categories, palustrine, riverine, and lacustrine. The Palustrine System includes all non-tidal wetlands dominated by trees, shrubs, and emergents (herbaceous vegetation). The Riverine System includes all wetlands and deepwater habitats contained within a channel except for wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens and habitats with water containing ocean derived salts in excess of 0.5 parts per thousand. The Lacustrine System includes wetlands and deepwater habitats that are within a topographic depression or dammed river channel, have a total area greater than 20 acres, and lacking vegetation (i.e., trees, shrubs, persistent emergents, emergent mosses or lichens) with greater than 30 percent aerial cover (Cowardin et al., 1979).

The study area contains six main groups of palustrine wetlands: emergent, forested, scrub-shrub, aquatic bottom, unconsolidated shore, and unconsolidated bottom. The riverine wetlands include lower perennial

unconsolidated bottom. The lacustrine wetlands include limnetic unconsolidated bottom. Most of the wetlands in the study area are associated with rivers, streams, or isolated bays.

3.2.7 Wildlife

There are two Wildlife Management Areas in Darlington and Florence counties (Great Pee Dee Heritage Preserve and Pee Dee Station Site). The Sand Hills State Forest, a Wildlife Management Area found in Chesterfield County, is located just north of the study area. Mammal species which are hunted at these wildlife management areas include white-tailed deer (*Odocoileus virginianus*), wild hogs (*Sus scrofa*), raccoon (*Procyon lotor*), and eastern cottontail rabbit (*Sylvilagus floridanus*). Other mammal species include gray fox (*Urocyon cinereoargenteus*), red fox (*Vulpes vulpes*), mink (*Mustela vison*), eastern fox squirrel (*Sciurus niger*), muskrat (*Ondatra zibethica*), and beaver (*Castor canadensis*) (Pitts, 1974; Morton, 2000; South Carolina Department of Natural Resources, 2001).

The Carolina Sandhills National Wildlife Refuge (NWR) is located approximately six miles north of the study area in Chesterfield County. Approximately 200 species of birds have been identified there. Common non-game bird species found at the Carolina Sandhills NWR are also likely to be found in Darlington and Florence counties. These common non-game bird species may include turkey vulture (*Cathartes aura*), mourning dove (*Zenaida macroura*), eastern screech owl (*Otus asio*), red-headed woodpecker (*Melanerpes erythrocephalus*), downy woodpecker (*Picoides pubescens*), eastern phoebe (*Sayornis phoebe*), white-eyed vireo (*Vireo griseus*), carolina chickadee (*Parus carolinensis*), brown-headed nuthatch (*Sitta pusilla*), carolina wren (*Thryothorus ludovicianus*), northern mockingbird (*Mimus polyglottos*), pine warbler (*Dendroica pinus*), field sparrow (*Spizella pusilla*), northern cardinal (*Cardinalis cardinalis*), eastern meadowlark (*Sturnella magna*), and house finch (*Carpodacus mexicanus*). Game bird species and waterfowl include wild turkey (*Meleagris gallopavo*), wood duck (*Aix sponsa*), American wigeon (*Anas americana*), American black duck (*Anas rubripes*), and mallard (*Anas platyrhynchos*) (U.S. Fish and Wildlife Service, Carolina Sandhills National Wildlife Refuge, 2001).

Sixty-six species of amphibians and reptiles have been identified at the Carolina Sandhills NWR. Common amphibian species found there which are also likely to be found in Darlington and Florence counties include bullfrogs (*Rana catesbeiana*), southern leopard frog (*Rana utricularia*), green treefrog (*Hyla cinerea*), southern toad (*Bufo terrestris*), Fowler's toad (*Bufo woodhousei fowleri*), mud salamander (*Psuedotriton montanus montanus*), and tiger salamander (*Ambystoma tigrinum tigrinum*). Common reptile species include snapping turtle (*Chelydra serpentina*), eastern box turtle (*Terrapene carolina*),

ground skink (*Scincella lateralis*), southern five-lined skink (*Eumeces fasciatus*), eastern garter snake (*Thamnophis sirtalis sirtalis*), black rat snake (*Elaphe obsoleta*), eastern kingsnake (*Lampropeltis getula getula*), and corn snake (*Elaphe guttata guttata*) (U.S. Fish and Wildlife Service, Carolina Sandhills National Wildlife Refuge, 2001).

3.2.8 Threatened and Endangered Animal Species

Information available from the USFWS listed federally threatened and endangered animal species that occur within Florence, Darlington, and Lee counties. Table 3-2 shows these species by county and their state and federal status. USFWS records indicate that one threatened and two endangered species may occur in Darlington and Florence counties. The USFWS did not list any federally proposed or candidate animal species in Florence, Darlington, and Lee counties (U.S. Fish and Wildlife Service, Southeastern Region Ecological Services, 1999).

The SCDNR HTP database was searched for the presence of threatened or endangered species and species of concern within the study area. This search revealed that one endangered species occurs, or may have occurred, within the study area: the red-cockaded woodpecker (*Picoides borealis*), a federally and state endangered species.

Table 3-2
Threatened and Endangered Animals by County

Common Name	Scientific Name	County	State Status	Federal Status
Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	Darlington	Endangered	-
Bald eagle	*Haliaeetus leucocephalus*	Florence	Endangered	Threatened
Red-cockaded woodpecker	*Picoides borealis*	Darlington Florence Lee	Endangered	Endangered
Shortnose sturgeon	*Acipenser brevirostrum*	Darlington Florence	-	Endangered

Threatened - A taxon "which is likely to become an endangered species within the foreseeable future."
Endangered - A taxon "in danger of extinction throughout all or a significant portion of its range."

3.3 HUMAN RESOURCES

Following is a description of the human resources in the study area that could be effected by the construction or operation of the proposed project. The topics addressed include land use patterns, socioeconomic patterns, cultural resources, and visual character.

3.3.1 Land Use and Development Patterns

This section contains information on general patterns, agriculture, residential areas, recreation areas, transportation, and utilities within the study area.

A majority of the land located in the study area is woodland and agriculture. According to the U.S. Department of Agriculture Forest Service, Southeastern Forest Experiment Station, approximately 53 percent of Darlington County and approximately 57 percent of Florence County was in forest land as of 1993 (Connor, 1993). The majority of forest land at that time was of the oak-pine type in Darlington County and loblolly pine-slash pine and oak-gum-cypress type in Florence County. Most of the forests in both counties are in private ownership (Connor, 1993; Connor, 1998). Evergreen forests cover approximately half of the forests in Florence County. This is followed by saturated bottomland forests and mixed forests (Florence Municipal/County Planning Department, 1997).

The timber industry is a multi-million dollar industry in South Carolina. The local value to harvest and transport timber in 1999 in South Carolina was over $300 million. Darlington and Florence counties ranked 28th and 5th, respectively, in cash receipts for timber harvest among South Carolina counties in 1999 (Harper, 2001).

3.3.1.1 Agriculture

Approximately 44 percent and 33 percent of the total land area is in farms in Darlington and Florence counties, respectively (Connor, 1993; Clemson University Extension Agriculture and Applied Economics, 2001). According to the 1997 Census of Agriculture, the total land in farms in Darlington County has increased slightly since 1987 whereas the total land in farms has decreased in Florence County (United States Department of Agriculture-National Agricultural Statistics Service, undated). The main crops produced in both Darlington and Florence counties include corn, cotton, soybeans, tobacco, and winter wheat. In 2000, Darlington County ranked first in South Carolina in cotton production and Florence County ranked first in South Carolina in soybean production.

Livestock in both counties include cattle, poultry (chickens and turkeys), and hogs. Cash receipts for crops were substantially greater in Florence County compared to Darlington County. Conversely, cash receipts for livestock were approximately four times greater in Darlington County compared to Florence County (Clemson University Extension Agriculture and Applied Economics, 2001).

3.3.1.2 Urban and Residential Areas

The majority of the study area is rural, but both Darlington and Florence counties have seen growth within the past decade, based on U.S. Census Bureau data. The population density in Darlington County is approximately 120 persons per square mile, whereas population density in Florence County is approximately 157 persons per square mile (U.S Census Bureau, 2002). The rural population in Darlington and Florence counties was approximately 67 percent and 48 percent, respectively, of the total population based on 1990 census data (South Carolina Budget and Control Board, Office of Research and Statistics, 2000).

The population density among the municipalities in the study area is relatively similar. According to the U.S. Census Bureau, population density was greatest in Florence (approximately 1,709 persons per square mile), followed by Darlington (approximately 1,566 persons per square mile), and Hartsville (approximately 1,517 persons per square mile). Population density in North Hartsville CDP is substantially smaller compared to the municipalities (approximately 646 persons per square mile). Hartsville has expanded generally southward and is beginning to encompass many of the existing transmission lines that were once rural.

There are 24 elementary, middle, and secondary schools in the Darlington County School District. Eight schools each in Hartsville and Darlington are located within the study area. There are 19 elementary, middle, and secondary schools in Florence School District One. Four of these schools, located in and around northern Florence, are within the study area. Thomas Hart Academy, a private school for grades 4 to 12, is located in the study area southwest of Hartsville along Flinns Road.

Florence-Darlington Technical College is also located within the study area along U.S. Highway 52 between Darlington and Florence counties. Coker College, a private college, is located within Hartsville.

3.3.1.3 Recreation Areas

Golf courses in the study area include the Hartsville Country Club, the Darlington Country Club, a golf course along E. McIver Road southeast of the Wellman Steel Plant, and one south of Tomahawk Road and U.S. Highway 15.

No known county parks are located in the study area. Several parks are located south of the study area. No state parks are present within the study area. Lee State Natural Area is located west of the study area along the Lynches River. The Carolina Sandhills National Wildlife Refuge and Sandhills State Forest is

located north of the study area in Chesterfield County, and the Great Pee Dee River Heritage Preserve is located east of the study area in Darlington County. Other opportunities for recreation in the study area include outdoor activities such as fishing, hunting, boating, and camping. A public fishing pier and boat access are located along the east shore of Lake Robinson (DeLorme, 1998).

The Darlington Raceway is located west of Darlington along S.C. 34 / 151. A smaller drag racing strip is also located west of Darlington along S.C. 34 / 151.

3.3.1.4 Transportation and Utilities

The study area is crisscrossed by U.S. highways, state and county highways, and local streets. Interstate 20 forms the southern boundary of the study area in Darlington and Florence counties. Interstate 95 crosses the southeast corner of the study area north of Florence. U.S. Highways 15, 52, and 401 are the major north-south transportation routes in the study area. U.S. Highways 15 and 52 diverge north of the study area. U.S. Highway 15 leads to Hartsville and then on to Bishopville in adjacent Lee County. State Route (S.C.) 403 joins U.S. Highway 15 south of Hartsville and extends into Florence County. U.S. Highway 52 connects Darlington and Florence. U.S. Highway 401 breaks from U.S. Highway 52 in Darlington and continues southwest to Sumter, South Carolina. S.C. 151 (Bobo Newsome Highway) and S.C. 34 are the major east-west roads in the study area. S.C. 151 crosses south of Hartsville and S.C. 34 crosses through Darlington. These roads merge to form S.C. 34 / 151 between Darlington and Hartsville in central Darlington County.

The South Carolina Department of Transportation has begun construction on a project to widen Interstate 95 between the interchange with Interstate 20 and S.C. 327 in Darlington and Florence counties. The anticipated date of completion for this project is April, 2004. This construction project involves the addition of a third lane in both directions and the widening or replacement of bridges (South Carolina Department of Transportation, 2002). Approximately 5.7 miles of this project is within the study area.

One CSX Transportation (CSXT) rail line crosses southeast from McBee, South Carolina and enters the study area near Lake Robinson and the Darlington County Plant. A South Carolina Central Railroad rail line runs east from Hartsville near the northern boundary of the study area toward U.S. Highway 52 / 401 and continues south along U.S. Highway 52 / 401 into Darlington. The rail line parallels U.S. Highway 52 into Florence eventually joining a CSXT rail line in Florence, south of the study area. This same South Carolina Central rail line also heads southwest from Hartsville adjacent to U.S. Highway 15 to

Bishopville, South Carolina (DeskMap Systems Inc, 1998). An abandoned rail line extends between Darlington and Hartsville (DeLorme, 1998).

Several public airports and public and private airstrips are located within and around the study area. Airports within the study area include Hartsville Municipal Airport and Branhams Airport. Curry Airport is a private airport located east of U.S. Highway 15 along E. Carolina Avenue. Paul's Plantation is a private airport located east of Society Hill Road north of Darlington. A heliport is located at the Carolina Pines Regional Medical Center south of Hartsville along S.C. 151 (South Carolina Division of Aeronautics, 2001).

3.3.2 Socioeconomic Patterns

This section contains data on populations and employment within Darlington and Florence counties and population data for the cities of Florence, Darlington, and Hartsville.

3.3.2.1 Population

The population in Florence County (125,761 persons) is approximately twice that of Darlington County (67,394 persons) (Table 3-3). The growth rate for the entire state of South Carolina from 1990 to 2000 was 15.1 percent. The growth rates for Darlington and Florence counties during the same time period were not as high as the state's growth rate (U.S. Census Bureau, 2002).

Darlington and Florence counties both increased in population by approximately nine and ten percent, respectively, from 1990-2000. The municipalities, in general, experienced either negative or minimal population growth, indicating an increase in the number of people residing outside of the municipalities. From the 1990 census, the nine incorporated municipalities in Florence County accounted for approximately 39 percent of the population (Florence Municipal/County Planning Department, 1997). By 2000, these 9 incorporated municipalities accounted for approximately 35 percent of the population in Florence County (U.S. Census Bureau, 2002). The growth in Darlington and Florence counties is due to both a natural increase (births > deaths) and immigration to the counties (South Carolina Budget and Control Board, Office of Research and Statistics, 2001). The population growth for both Darlington and Florence counties is expected to continue through the current decade (Table 3-3).

Municipalities within the study area include Hartsville and Darlington in Darlington County and Florence in Florence County. Of these cities, Florence is the largest municipality, with a population of 30,248 persons. This is approximately 25 percent of the population in Florence County. The cities of Hartsville

and Darlington are substantially smaller compared to Florence. Data from the U.S. Census Bureau list the population in 2000 for Darlington at 6,720 persons and for Hartsville at 7,556 persons (U.S. Census Bureau, 2002). Both cities experienced a decrease in population from 1990 to 2000. This decrease in population was moderately larger in Hartsville compared to Darlington (Table 3-3).

Table 3-3
Population Data

County / City	Population						
	1980[1]	Percent Change (1980-1990)	1990[2]	Percent Change (1990-2000)	2000[3]	Percent Change (2000-2010)	2010 Projected[2]
Darlington County	62,717	-1.4	61,851	9.0	67,394	2.8	69,300
Florence County	110,163	3.8	114,344	10.0	125,761	4.6	131,500
City of Florence	30,062	-0.5	29,913	1.1	30,248	-	-
City of Darlington	-	-	7,310	-8.1	6,720	-	-
City of Hartsville	-	-	8,372	-9.7	7,556	-	-
North Hartsville CDP	-	-	2,906	7.9	3,136	-	-

1 Elements of the Florence County Comprehensive Plan (1997)
2 South Carolina Budget and Control Board, Office of Research and Statistics (2001).
3 U.S. Census Bureau (2002)

3.3.2.2 Employment

Over 21,000 and 55,000 people in Darlington and Florence counties, respectively, were employed in private, non-farm activities in 1999 (U.S. Census Bureau, 2002). Unemployment rates in Darlington and Florence counties for 2001 were 6.5 percent and 5.2 percent, respectively (South Carolina Employment Security Commission, 2002). The economy of Darlington and Florence counties is largely based on agriculture, manufacturing, wholesale and retail trade, professional services, accommodation and foodservice, and health care and social services. Administrative, support, waste management, and remediation services also contribute to the economies of Darlington and Florence counties. According to available data, the manufacturing sector is the largest employer in both counties. This is consistent with the trend for the state of South Carolina. Manufacturing employs over 8,000 people in Darlington County and over 11,000 people in Florence County. The manufacturing sector consists of textile, paper, and chemical industries in Darlington County. In Florence County, the manufacturing sector is much more

diverse, consisting of textiles, apparel, food, paper, chemicals, fabricated metals, machinery, and electrical equipment (U.S. Census Bureau, 2001).

3.3.3 Cultural Resources

Burns & McDonnell archaeologists performed a records search at the South Carolina Institute of Archaeology and Anthropology, University of South Carolina. They located a total of 113 recorded archaeological sites, landmarks, and historical structures within the study area. Twenty-seven of these sites have been determined not eligible for the National Register of Historic Places (NRHP), and only seven of the recorded archaeological and historical sites had been determined eligible for listing at the time the research was completed. Thirty-seven of the sites and structures are currently listed on the NRHP. Seventy-eight percent of the listed sites and structures were in the cities of Darlington and Hartsville. No determination has been made for inclusion on the NRHP for eleven sites in the study area.

The Oaklyn Plantation, a 25,840-acre historic district added to the National Register in 1995, is located within the study area in southeast Darlington County near the junction of S. Charleston Road (S.R. 35) and Pocket Road (S.R. 173) (National Register of Historic Places.com, 2002). It is a late 19th to 20th century farm with a main house and several outbuildings. The Oaklyn Plantation is still in use today as a farming operation. An existing CP&L transmission line, the Robinson Plant-Florence 230-kV line (Figure 3-1), crosses the eastern half of the Oaklyn Plantation.

3.3.4 Visual Character

The visual character of an area is a function of the terrain, land cover, and land use. Within the study area, the land cover is dominated by forests dissected by agricultural fields. Forest land accounts for approximately 53 percent of the land in Darlington County and approximately 57 percent of the land in Florence County (Connor, 1993). Trees help obscure the presence of a transmission line. Being in the Coastal Plain physiographic region, the terrain of the study area is also relatively flat, a feature that increases the potential visibility of the line. Several creeks and the riparian forests associated with those creeks dissect the study area. Bays, or isolated wetland depressions, are also common in the study area. Many of these bays have been converted to agriculture, but remaining bays also contribute to the visual character of the area.

Highways, county roads, transmission and distribution lines, gas pipelines, and railroads cross the study area. Aside from the roads and railroads described in Section 3.3.1.4 above, two known gas pipelines run northwest to southeast across the study area. Numerous CP&L, Santee-Cooper, and Central Electric

Cooperative transmission and distribution lines and Pee Dee Electric Cooperative distribution lines are located throughout the study area. Approximately 12 transmission lines are located around the Darlington County Plant and Robinson Plant northwest of Hartsville. These lines cross east and south through the study area from the Darlington County Plant and Robinson Plant. Eight transmission lines connect with the Florence Substation in the southeast corner of the study area.

In addition, commercial development extends along U.S. Highway 52 nearly all the way between Florence and Darlington, degrading the visual character of this corridor. Clearcuts of pine plantations throughout the study area further degrade the visual quality of the region.

4.0 Analysis of Alternatives

4.0 ANALYSIS OF ALTERNATIVES

This section presents the route selection process used for the Darlington County Plant-Florence 230-kV Transmission Line Project. The following describes the process for identifying preliminary routes, the gathering of public input, and the basis for the evaluation of the alternatives. The evaluation ultimately resulted in the selection of a preferred and alternate route.

4.1 OVERVIEW OF THE ROUTING PROCESS

CP&L retained Burns & McDonnell to assist in the route selection, public involvement and documentation for the project. Following is an overview of the steps involved in the identification of the alternative routes and the selection of a preferred and alternate route.

CP&L and Burns & McDonnell first established the limits of the study area based on project need and a preliminary review of possible constraints in the area (see Figure 3-1). After establishing the study area, potential alternative routes were identified. The objective was to identify routes that connected the Darlington County Plant to the Florence Substation while avoiding or minimizing impacts to both human and natural resources. Local, state, and federal government agencies were contacted to obtain information relevant to the routing process. Following the identification of potential alternative routes, the study team quantified the social and environmental resources that would be impacted by each possible route. The potential alternative routes were also shown to the public and local officials to obtain input for the evaluation of the alternatives. The quantitative data, public input, and engineering criteria were used in evaluating the alternatives to select a preferred and alternate route for the proposed transmission line. Activities leading to the determination of the final route alternatives are described in more detail in the following sections.

4.2 IDENTIFICATION OF ALTERNATIVE ROUTES

The objective of the routing analysis was to identify the route or routes that offered the most benefits in terms of providing reliable electric power but that also minimized adverse impacts to the social and natural environment. This effort included four main components:

- Field reconnaissance of the study area;
- Review of USGS topographic maps and 1999 aerial photography;
- Review of local planning and zoning documents;

- Contacts with local, state, and federal agencies.

Based on this input, the project team identified routes that would connect the two substations and minimize adverse human and environmental impacts in the study area. The major concerns regarding routing were to maximize the distance of the line from existing homes and urban areas, avoid airports, and minimize lengths through wetlands. While it was not possible to design a route that avoided all impacts, the routes were designed to minimize to the extent possible impacts to residences. Some of the alternatives were located along existing utility corridors to minimize impacts on all resources. Some existing corridors could not be paralleled, however, without causing significant hardships to residences located adjacent to them.

The routes consist of individual segments that may be combined in different arrangements to form a continuous path from the Darlington County Plant to the Florence Substation. The routes and their components are depicted graphically on USGS quadrangles in Figure 4-1. The study area consists of 42 individual segments that can be combined to form 663 possible routes between the Darlington County Plant and the Florence Substation. All routes intersect at a common point where Segments 14, 15, 16, and 17 meet south of the Darlington County Plant. To facilitate a more manageable and understandable route comparison, the routes were subdivided into two groups based on the common intersection. The routes formed by combining Segments 1 to 15 were labeled with an "A". These segments can be combined to form 17 different routes. The routes created by combining Segments 16 to 42 were labeled with a "B". These segments can be combined to form 39 different routes. The "A" and "B" routes were compared separately during the route analysis. The selected "A" and "B" routes must be combined to form a complete route between the Darlington County Plant and Florence Substation.

4.3 PUBLIC INVOLVEMENT ACTIVITIES

To determine community values relative to the proposed project, the route selection process included two forms of public input. Input was first obtained through meetings with public officials and local agencies, and second, through public information meetings held by CP&L. Input was also obtained from the public via information available on the CP&L Website (http://www.cpl.com/about/transmission/index.html). This input was useful in determining the values and attitudes of the residents and public officials regarding the project, thereby enabling the team to identify the most appropriate routing criteria used to evaluate the routes. The public participation program also provided the public with an understanding of the need for the project, the decision-making criteria used to select the preferred route, and a forum to voice concerns with the proposed project.


Darlington County Plant
CHESTERFIELD COUNTY
DARLINGTON COUNTY
LEE COUNTY
DARLINGTON COUNTY
Index Map
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0
4,000
Feet
LEGEND
Existing Substations
Existing CP&L Transmission Lines
County Boundary
Alternative Routes
Existing Non-CP&L Transmission Lines.
Study Area Boundary
11 Segment Number
Pipelines
Burns & McDonnell
since 1898
Figure 4-1
DARLINGTON COUNTY PLANT - FLORENCE ALTERNATIVE ROUTES
Sheet 1 of 4
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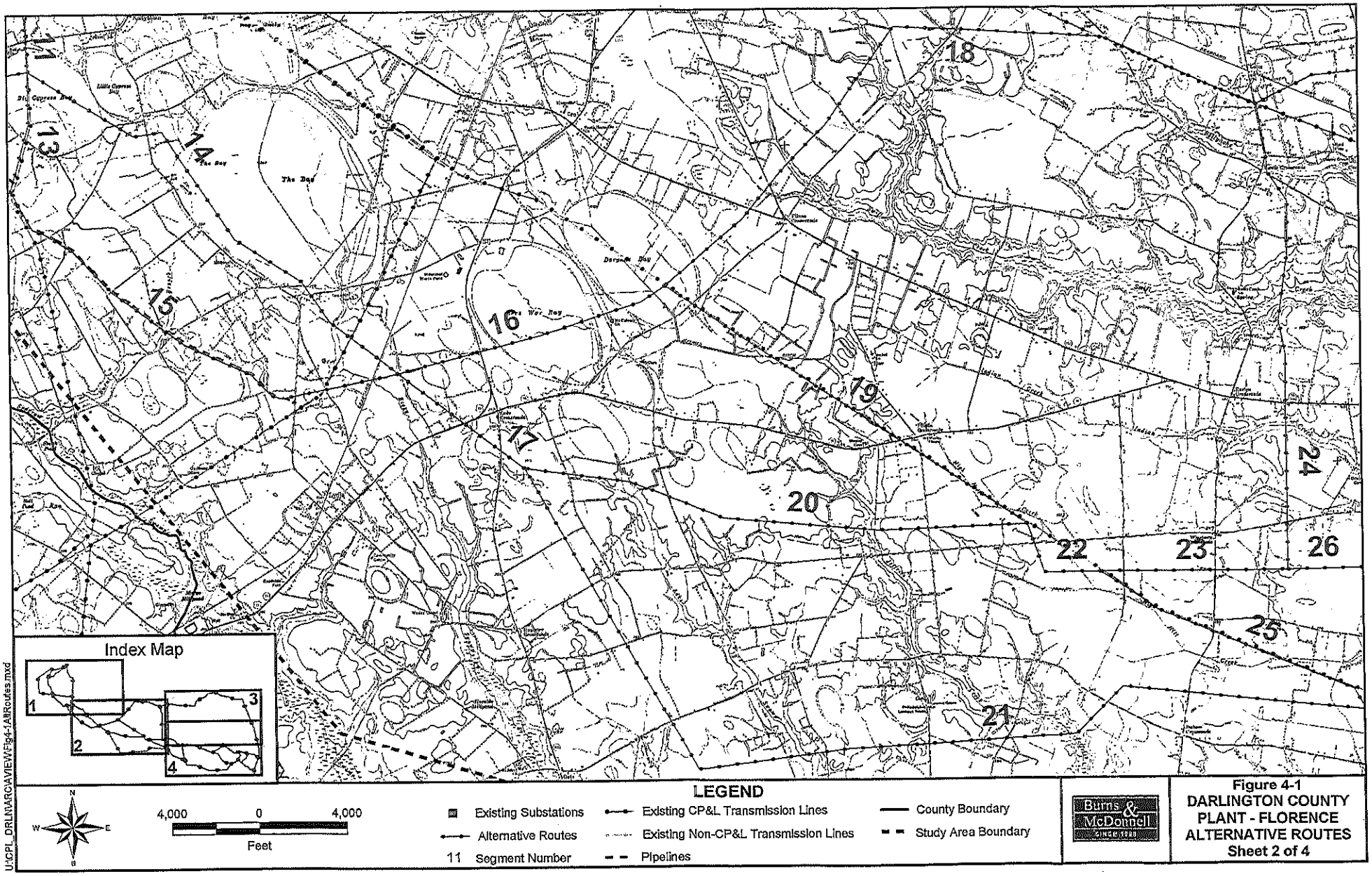
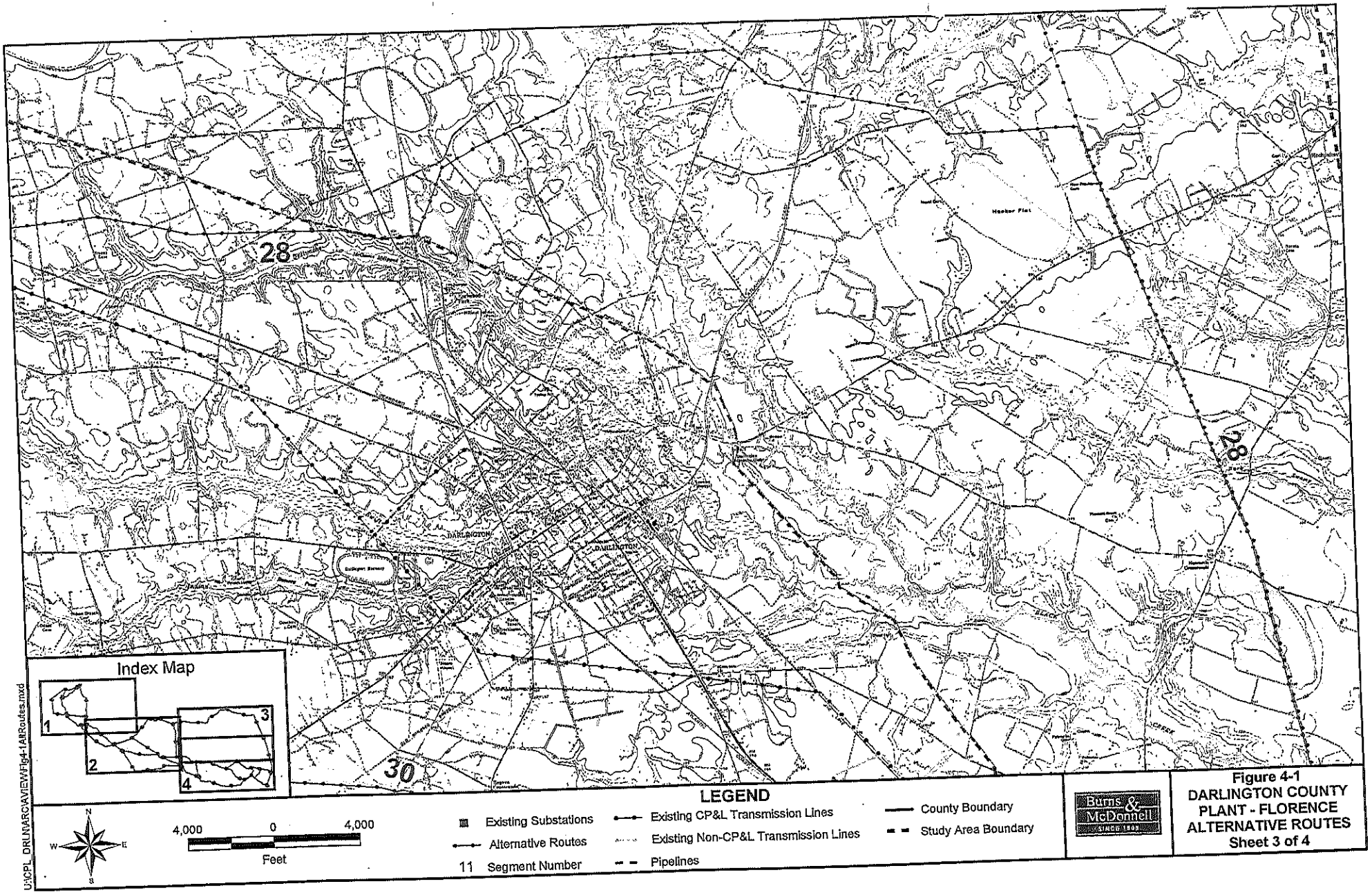


Figure 4-1
DARLINGTON COUNTY PLANT - FLORENCE ALTERNATIVE ROUTES
Sheet 2 of 4


28
28
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DARLINGTON
DARLINGTON
Index Map
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Feet
LEGEND
Existing Substations
Alternative Routes
11 Segment Number
Existing CP&L Transmission Lines
Existing Non-CP&L Transmission Lines
Pipelines
County Boundary
Study Area Boundary
Burns & McDonnell
Figure 4-1
DARLINGTON COUNTY
PLANT - FLORENCE
ALTERNATIVE ROUTES
Sheet 3 of 4
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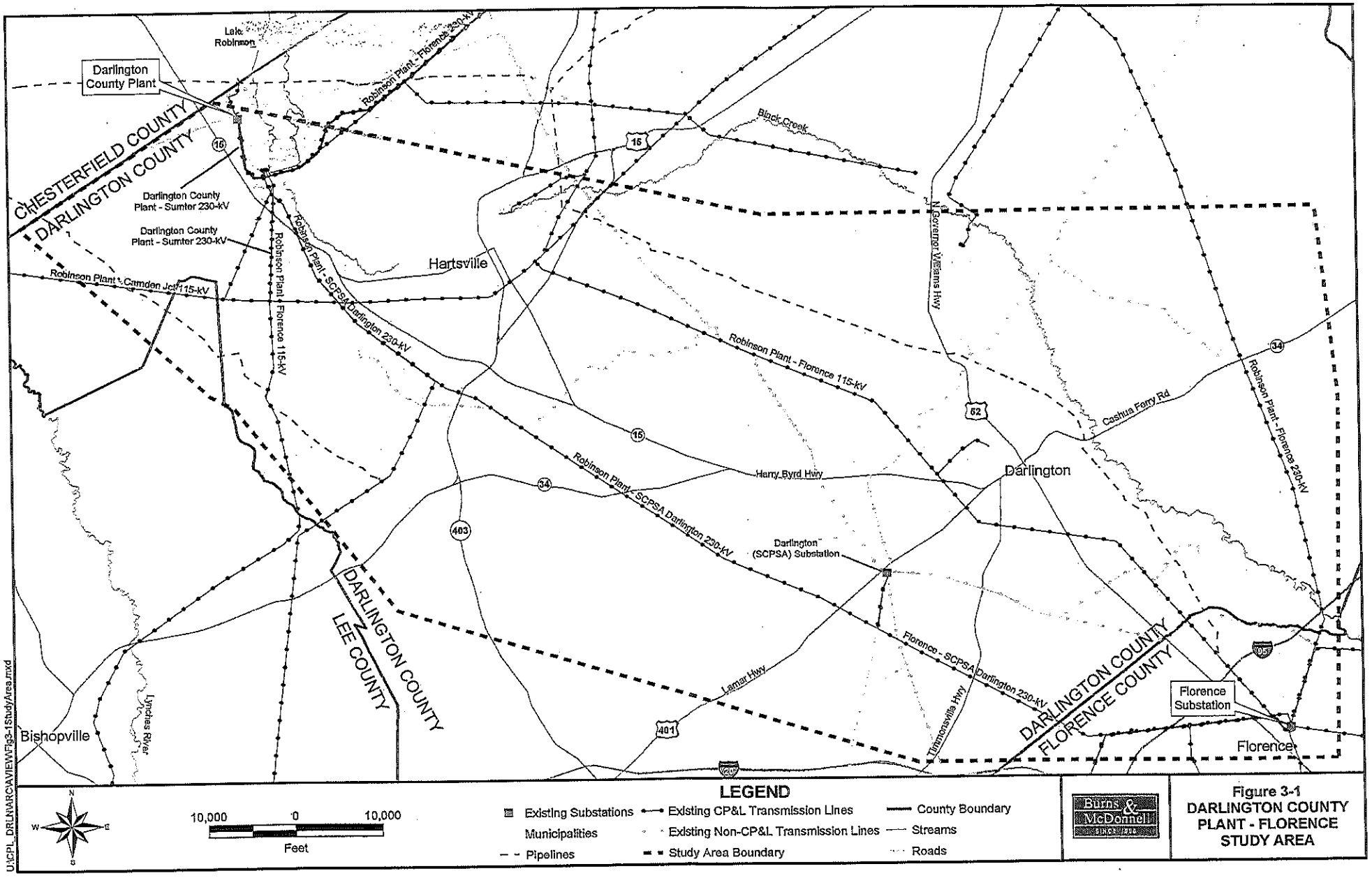
Lake Robinson
Darlington County Plant
CHESTERFIELD COUNTY
DARLINGTON COUNTY
Robinson Plant - Florence 230-kV
Black Creek
Darlington County Plant - Sumter 230-kV
Darlington County Plant - Sumter 230-kV
Robinson Plant - Camden Jct 115-kV
Robinson Plant - Florence 115-kV
Robinson Plant - SCPSA Darlington 230-kV
Hartsville
Governor Williams Hwy
Robinson Plant - Florence 115-kV
Cashua Ferry Rd
Robinson Plant - Florence 230-kV
Harry Byrd Hwy
Darlington
Robinson Plant - SCPSA Darlington 230-kV
Darlington (SCPSA) Substation
DARLINGTON COUNTY
LEE COUNTY
Florence - SCPSA Darlington 230-kV
Lamar Hwy
Timmonsville Hwy
DARLINGTON COUNTY
FLORENCE COUNTY
Florence Substation
Florence
Bishopville
Lynches River
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Feet
LEGEND
Existing Substations
Municipalities
Pipelines
Existing CP&L Transmission Lines
Existing Non-CP&L Transmission Lines
Study Area Boundary
County Boundary
Streams
Roads
Burns & McDonnell
Figure 3-1
DARLINGTON COUNTY PLANT - FLORENCE STUDY AREA
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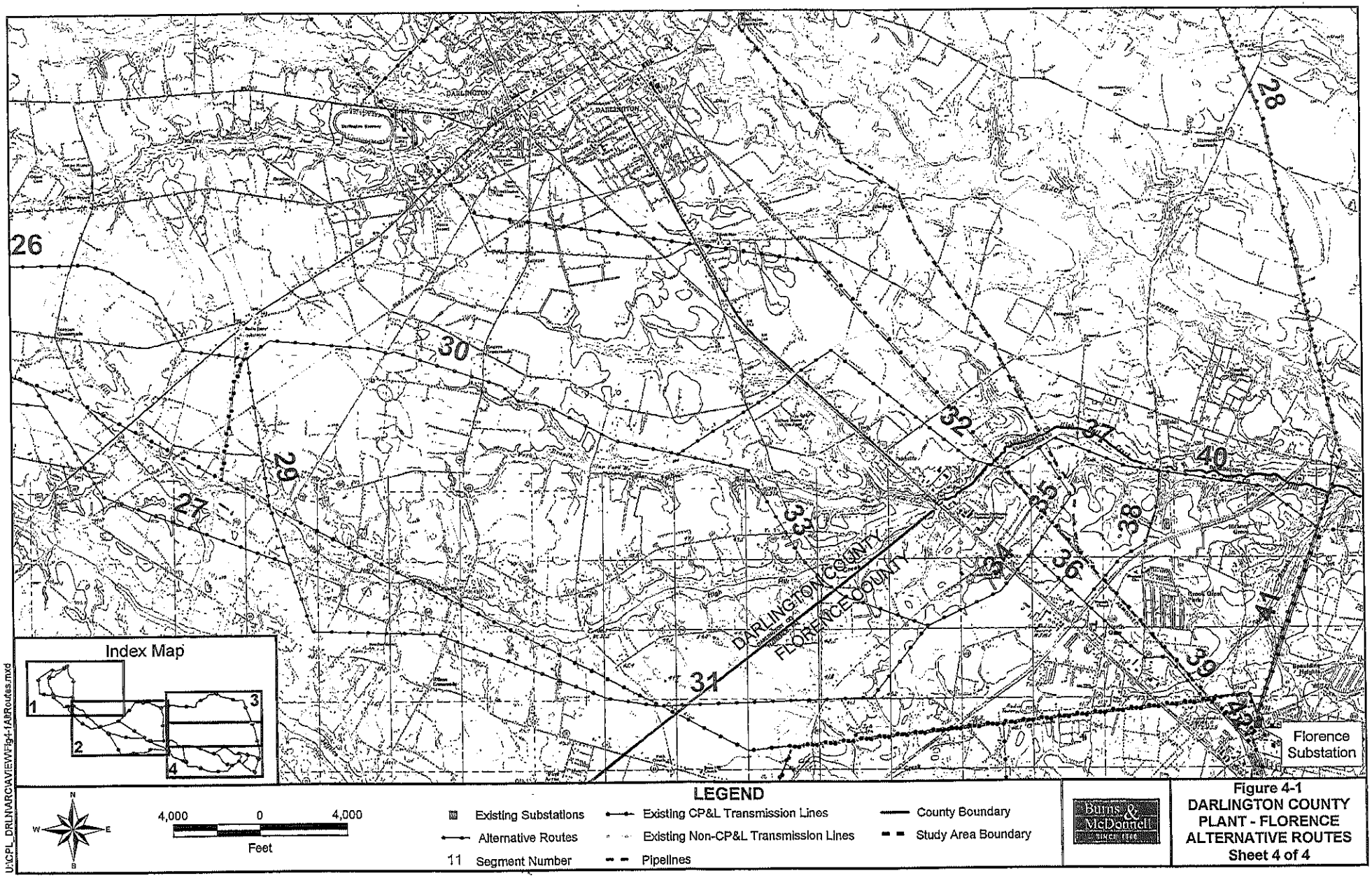

U:\CPL_DRLN\ARC\AVIEW\Fig4-1\AllRoutes.mxd

Figure 4-1
DARLINGTON COUNTY PLANT - FLORENCE ALTERNATIVE ROUTES
Sheet 4 of 4

4.3.1 Public Officials

CP&L Community Relations personnel met with city managers, county commissioners and other local officials to notify them of the project. Burns & McDonnell representatives met with local agency personnel to gather information on new or proposed developments and other constraints in the project area, including the Florence City / County Planning Department Manager, Florence County Recreation Department Director, Florence City Recreation Director, Darlington County Planning Director and Right-of-Way Agent, the Darlington County Parks and Recreation Director, and the Darlington County Mapping and GIS Department.

State and federal agencies were contacted by letter to provide input on threatened and endangered species, wetlands, forest resources, cultural resources, and other permitting issues. Copies of agency correspondence are included in Appendix A.

4.3.2 Public Information Meetings

To provide residents of the area with information about the project and gather public input on route alternatives, CP&L held two open-forum informational workshops in May, 2002. The first meeting was held at the American Legion Post 13 in Darlington on May 21st. The second meeting was held at the Williams Middle School in Florence on May 23rd. The media and public were first notified of the project and workshops through a news release about a month prior to the workshops. The workshops were then advertised in the Florence Morning News, the Darlington News and Press, and the Hartsville Messenger one week before the workshops. An informational letter describing the project and advertising the workshop was mailed to all property owners within 200 feet of the alternate routes. Information about the project, a map of the study area, and input forms were also available on CP&L's website (http://www.cpl.com/about/transmission/darlington.html). Copies of this information are included in Appendix B.

The meetings included displays with information on project need, engineering, route alternatives, environmental management, and right-of-way requirements. Representatives from CP&L and Burns & McDonnell were present to address the public's questions and take comments. A system map of the transmission lines and substations presently serving the study area and an iterative computer program illustrating future power expectations were displayed to help show the need for the project. Potential routes for the proposed transmission line were depicted on 1999 aerial photographs and on USGS quadrangle maps. No preferred or alternate route had been selected at the time of the workshops.

Photographs and drawings showing the types of structures that would be used for the project were displayed. CP&L staff discussed right-of-way acquisition and maintenance, and electric and magnetic fields (EMF) associated with transmission lines.

Participants at the open house received a written questionnaire to communicate their opinions on the routing criteria, the segment locations, preferred route locations, and issues of concern regarding the project. This questionnaire was also available on CP&L's project Website. Appendix B contains a sample questionnaire and a summary of the responses received to the questionnaire. The results from the questionnaire are discussed in the next section.

4.3.3 Summary of Concerns

The questionnaires, personal conversations, letters, petitions, and other comments collected from the workshops provided feedback to the project team on project issues and concerns. Sixty-three questionnaires were received during the open house, by mail, and via the CP&L Website. Eight letters were submitted either with questionnaires or separately.

CP&L and Burns & McDonnell staff reviewed all public input before evaluating the routes. A summary of the responses to the questionnaires is in Appendix B. Fifty-seven percent of the respondents indicated they understood the need for this transmission line. A majority of respondents also indicated that the open house and information provided therein were helpful for their understanding of the project.

Questions 2 and 3 on the questionnaire asked respondents to rank the importance of routing factors as issues of concern in their area or to suggest additional factors of importance to them. The principal concerns regarding the project were length across agricultural land and proximity to residences. Cost and total length of the line were the public's lowest priorities. The public's rankings then were weighted according to the order in which all respondents prioritized them. The public's weighted ranking of the routing considerations is shown in Table 4-1. The routing criteria are defined later in this section.

Question 4 solicited respondent's specific concerns for particular segments. Segments 2, 14, 17, 31, and 32 were the most frequently mentioned segments, primarily due to a concern that the segments pass too close to residences, cross fields used for agriculture, or where center-pivot irrigation is planned. Based on the response to Question 5, most respondents (88 percent) preferred or found it acceptable for the new transmission line to parallel existing gas pipelines. Likewise, a majority of respondents (74 percent) preferred or found it acceptable for the new transmission line to parallel existing transmission lines. In

contrast, only 24 percent of the respondents preferred or found it acceptable for the new line to be built along new corridors.

The public input was used in the evaluation through the weighting of the routing criteria and in making the final selection of the preferred and alternate routes.

Table 4-1
Public Ranking of Routing Considerations

Routing Considerations	Weighted Total*
Minimize length across agricultural land	682
Maximize distance from residences	617
Maximize length along existing transmission lines	576
Minimize visibility of the line	446
Maximize distance from public facilities	388
Maximize length along gas pipelines	375
Minimize length across forest land	358
Maximize distance from historic sites	329
Minimize length through wetlands	324
Maximize distance from businesses	318
Maintain reliable electric service	308
Minimize number of stream/river crossings	279
Keep costs down	244
Minimize total length of line	220

*Weighted total is the frequency of responses multiplied by the weight for each factor. The weights ranged from highest priority (14), to lowest priority (1).

4.3.4 Segment Adjustments

No adjustments were made to the segments following the open house. While some of the workshop participants raised concerns about particular segments, the constraints along these segments did not allow for adjustments. For example, it was not considered reasonable to adjust a segment away from one house or off someone's property if the adjustment caused the proposed segment to be closer to another person's home or on another's property. Several comments were made about future plans to potentially develop particular parcels for residential or industrial developments or to install center-pivot irrigation systems. However, specific plans and details were not yet developed or available. If plans are solidified for these parcels and more details are available prior to acquisition of easements, the route could be adjusted to minimize impacts to these developments. Minor adjustments may also be made once easement negotiations are initiated with landowners along the selected route.

4.4 IDENTIFICATION OF THE PREFERRED ROUTE

The analysis of alternatives was based on social, environmental, and engineering criteria. The criteria were quantified for each segment and summed for each route. Following is a description of the process that resulted in the selection of a preferred and alternate route.

4.4.1 Evaluation Criteria

The evaluation of the proposed routes included a systematic comparison of the alternatives based on the social, environmental, and engineering criteria that represent the potential adverse effects on resources in the study area. Table 4-2 shows the routing criteria used in this analysis. The primary source of the data used in this analysis was 1999 false-color composite imagery reproduced at a scale of 1 inch = 1,000 feet. Some of the criteria were quantified using Geographic Information System (GIS) software; others were calculated by measuring information directly from the aerial photography. Following is a description of each of the factors.

Table 4-2
Routing Criteria

Criteria	Measure
Total length	Feet
Length not parallel to existing transmission lines	Feet
Length not parallel to gas pipelines	Feet
Residential proximity score	Score
Businesses within 200 feet	Number
Public facilities within 200 feet	Number
Cleared / agricultural land crossed	Acres
Woodland Crossed	Acres
Wetlands Crossed	Acres
Perennial streams crossed	Number
Visibility rating	Score
Heavy angles	Number

Total Length is a general indicator of the overall presence of the project. Length is also an indicator of construction costs. The longer the proposed route, the more expensive it would likely be if all other factors were equal. Length parallel to existing transmission lines and length parallel to gas pipelines were measured because following existing corridors is generally considered to have less impact than a new

right-of-way. Because the new right-of-way is the concern, **Length Not Parallel To Existing Transmission Lines** and **Length Not Parallel To Gas Pipelines** were used in the analysis of potential impacts.

Residences within 100 feet and 101-200 feet from each proposed segment were quantified and then converted into the **Residential Proximity Score**. The score was derived by multiplying the number of residences within 100 feet by 2 and adding that value to the number of residences within 101-200 feet of the line. This score thereby reflects a greater impact on those residences within 100 feet of a transmission line. **Businesses Within 200 Feet** and **Public Facilities Within 200 Feet** were also quantified.

The land use categories reflect the major land uses in the study area. **Cleared / Agricultural Land Crossed** was measured from the false-color imagery and consists of yards, pastures, cropland, clearcuts, and any other cleared land along the routes. **Woodland Crossed**, also measured from the false-color imagery, consists of the forested areas that would be cleared along each route. **Wetlands Crossed** were measured from National Wetland Inventory (NWI) maps produced by the U.S. Fish and Wildlife Service. Acres of cleared or agricultural land, woodland, and wetlands crossed were calculated using right-of-way width based on whether the proposed line would be paralleling an existing corridor or on new right-of-way. Right-of-way width varied from 70 to 100 feet, depending if the segment would be on new right-of-way, parallel to existing transmission lines, or parallel to gas pipelines (see Figures 2-6, 2-7, 2-8, and 2-9). Calculating acres impacted by the proposed line better reflects the overall impact on the different land uses than length because right-of-way widths vary according to the presence or absence of an adjacent existing utility.

Because the project area is comprised of both wooded and agricultural or cleared land and the topography is relatively flat, visibility of the line could be of concern. The **Visibility Rating** was based on the length of the line that was considered to have a high (5), medium-high (4), medium (3), medium-low (2), or low (1) impact. Table 4-3 shows the values that were assigned to portions of segments based on the presence of homes, roads or businesses within a quarter-mile of the segment. It was assumed the terrain or vegetation would typically block the visibility of the line beyond a quarter of a mile and that 100 feet of trees between the transmission line and houses, roads or businesses would sufficiently block the view of the transmission line such that visibility would be negligible.

Direct view of the line within 1,300 feet of a house was assigned the highest impact because the new transmission line would impact people living near the line the most often and the most directly. The

transmission line would also be visible from roads crossed by or adjacent to the new line, but the view would be brief and temporary, so a lower impact was assigned. The visibility of the new line from businesses was considered less because it is generally more publicly acceptable to view transmission lines in commercial areas. In locations where an existing line is already present and has already contributed to a visibility impact, the new transmission line would not result in the same level of impact to visibility as a new line and ratings were reduced accordingly. Portions of segments through forested or cleared areas not visible from homes, roads or businesses were assigned the lowest impact. In cases where two or more features (i.e., houses, roads, or businesses) were visible within 1,300 feet of a segment, the highest rating was assigned. Once a rating was assigned, the lengths of the line considered to have a high, medium-high, medium, medium-low, or low impact were multiplied by the rating. These values were then added together to determine the overall visibility rating for a particular segment.

Table 4-3
Visibility Ratings

Feature Visible within 1,300 feet of Proposed Segment	Right-of-Way	
	New Corridor	Parallel to Existing Transmission Line
House	5	3
Road	4	2
Business	3	1
Through Forest or None of the Above Features Present	1	1

Heavy Angles represents the number of angles greater than 30 degrees that would be required for each segment. Aside from angles to avoid homes and other constraints, reliability considerations require that crossings of existing transmission lines, roads, and other linear features be nearly 90-degrees (perpendicular to the linear feature). Heavy angles require a larger, more visible structure and the use of guy wires or other support features. These structures are more expensive and result in greater land disturbance during construction. The number of such angles required for each segment was estimated from the route maps using a protractor.

4.4.2 Weighting the Routing Criteria

All of the above categories were considered to represent the potential impact of construction and operation of the new transmission line. The level of concern for the criteria, however, varied as indicated by the ratings in the questionnaires. Burns & McDonnell staff assigned weights to the factors based on the input from the questionnaires and experience with potential impacts of transmission line projects. The

weights associated with each routing factor and the ranks resulting from the public input are presented in Table 4-4. The names of the routing factors vary slightly from the descriptions on the public questionnaire, but are identical in meaning.

Table 4-4
Factor Ranking and Weights

Factor	Public Rank	Weight
Cleared/agricultural land crossed	1	13
Residential proximity score	2	13
Length not parallel to existing transmission lines	3	10
Visibility rating	4	10
Public facilities within 200 ft.	5	9
Length not parallel to gas pipelines	6	8
Woodland crossed	7	7
Wetlands crossed	9	5
Businesses within 200 ft.	10	4
Perennial streams crossed	12	3
Heavy angles (i.e., cost and visibility)	--	2
Total length	14	1

The range of weights was determined by the number of factors and the relative importance of each factor in relation to the others, based primarily on the weighted ranks calculated from the public responses (see Table 4-1). Some factors were given identical weights due to a narrow margin of difference between the weighted ranks applied by the public. Similarly, there are gaps between the weights some factors received due to a large difference in the ranks for those factors applied by the public. The public also ranked reliability and distance from historic sites, which were not included as routing factors because reliability is unquantifiable, and there was only one National Register-listed or eligible historic site near the proposed routes.

4.4.3 Identification of the Preferred and Alternate Route

The route network between the Darlington County Plant and the Florence Substation consisted of 42 segments that could be combined to form 663 possible routes. To make the route comparison more manageable, the alternative routes from the Darlington County Plant to the Florence Substation were divided into two groups. All possible routes pass through a common point where Segments 14, 15, 16, and 17 intersect (see Figure 4-1), enabling a logical split of the routes at this point. The first group of

routes ("A") exits the Darlington County Plant and is comprised of Segments 1 through 15, which can be combined to form 17 alternative routes (A1 – A17). The second group continues east from the common point to the Florence Substation and is comprised of Segments 16 through 42, which can be combined to form 39 alternative routes (B1 – B39). A complete route from the Darlington County Plant to Florence Substation requires the combination of an "A" and a "B" route. The calculation of route scores and the resulting analysis for the "A" routes was independent of the scoring and analysis for the "B" routes.

Once totals were summed for each of the routing criteria for the 56 alternative "A" and "B" routes, a score was calculated based on the route's position relative to the mean (or average) and standard deviation of values for that factor. This statistical Z-score technique reflects the variability among the routes for a factor. A negative score indicates the score for that route is lower than the mean for all of the routes for that specific criteria. A positive score represents values higher than the mean. These raw scores were then multiplied by the weights described in the previous section, and these values were added across the criteria for each route. The segment data, route components, route data, and weighted scores are shown in Tables 4-5, 4-6, 4-7, and 4-8. The raw scores are included in Appendix C. The route selection process included this systematic analysis of the alternatives, combined with an understanding of the circumstances in the study area and the public input received.

The preferred route from the Darlington County Plant to the Florence Substation was identified by selecting the best "A" and best "B" routes, and combining them to form a complete route.

The weighted scores for the "A" alternative routes ranged from a low of –27.7 (Route A6) to a high of 45.6 (Route A2). The weighted scores for the "B" routes ranged from a low of -73.6 (Route B25) to a high of 143.8 (Route B11). Table 4-7 presents the weighted scores for the "A" and "B" routes sorted from lowest to highest score. A lower score indicates fewer impacts, while a higher score typically indicates greater impacts. These scores are not considered a definitive comparison of routes; rather they provide a useful index of the relative overall impact associated with the alternatives. Alternatives with scores within 20 percent of the top score were determined to warrant closer evaluation. The point of this methodology is to narrow the analysis to a few routes that could then be evaluated further in order to make a final recommendation.

Table 4-5
Segment Data

Segment	Total Length (ft.)	New ROW (acs.)	Length Not Parallel Existing Transmission (ft.)	Length Not Parallel Gas Pipelines (ft.)	Residences within 100 ft.	Residences within 200 ft.	Residential Proximity Score	Businesses within 200 ft.	Public Facilities within 200 ft.	Cleared / Agricultural Land Crossed (acres)	Woodland Crossed (acres)	Wetlands Crossed (acres)	Perennial Streams Crossed (number)	Visibility Rating	Heavy Angles (number)	Segment
1	1,750	4.0	1,750	1,750	0	0	0	0	0	2.9	0.9	0.0	0	1.7	0	1
2	22,900	39.6	4,000	22,900	1	5	7	1	0	25.2	13.3	0.9	1	51.4	8	2
3	8,400	19.3	8,400	8,400	0	1	1	0	0	2.0	17.3	0.0	0	10	1	3
4	12,950	29.7	12,950	12,950	0	0	0	0	0	13.9	15.3	4.1	2	17.9	3	4
5	5,450	12.5	5,450	5,450	0	0	0	0	0	5.1	7.5	2.3	2	13.7	1	5
6	12,950	29.7	12,950	12,950	0	0	0	0	0	0.7	29.0	1.7	0	13.2	3	6
6z	12,950	29.7	12,950	12,950	0	0	0	0	0	0.7	29.0	1.7	0	13.2	4	6z
7	30,100	61.5	20,550	28,950	0	0	0	0	0	24.3	36.1	2.8	1	65.9	2	7
7z	30,100	61.5	20,550	28,950	0	0	0	0	0	24.3	36.1	2.8	1	65.9	3	7z
8	12,600	20.2	0	12,600	0	3	3	0	0	2.2	18.0	0.0	0	13.7	1	8
9	12,950	19.8	12,950	2,100	0	0	0	0	0	6.8	12.6	0.0	0	32.3	2	9
10	3,750	8.6	3,750	3,750	0	0	0	0	0	3.3	5.3	3.5	0	9.6	1	10
11	5,350	8.6	0	5,350	0	0	0	0	0	3.2	5.3	2.1	0	6.4	0	11
11z	5,350	8.6	0	5,350	0	0	0	0	0	3.2	5.1	2.1	0	6.4	1	11z
12	6,050	9.5	6,050	1,250	0	0	0	0	0	4.7	5.2	1.1	0	10.8	2	12
13	5,700	9.0	500	5,200	0	0	0	0	0	1.1	7.9	3.8	0	8.8	1	13
14	22,950	52.7	22,950	22,950	0	0	0	0	0	22.2	30.1	27.3	0	57.3	3	14
14z	22,950	52.7	22,950	22,950	0	0	0	0	0	22.2	30.1	27.3	0	57.3	4	14z
15	21,600	34.8	21,600	5,500	0	0	0	0	0	20.0	14.7	12.2	2	62	4	15
15z	21,600	34.8	21,600	5,500	0	0	0	0	0	20.0	14.7	12.2	2	62	5	15z
16	13,000	29.8	13,000	13,000	0	0	0	0	1	15.5	14.1	13.7	1	33.2	0	16
17	7,300	16.8	7,300	7,300	0	0	0	0	0	13.4	3.3	1.7	0	29.8	0	17
18	33,500	64.2	15,100	33,500	0	0	0	0	0	28.6	34.9	22.6	3	67.4	4	18
19	20,050	32.2	0	20,050	0	3	3	0	0	19.4	12.5	5.1	2	34.5	6	19
20	23,500	53.9	23,500	23,500	0	0	0	0	0	21.9	32.0	13.4	1	61.5	2	20
21	48,000	110.2	48,000	48,000	0	0	0	0	0	51.1	58.5	34.6	2	113.8	4	21
22	5,000	11.5	5,000	5,000	0	0	0	0	0	6.4	5.1	0.2	1	9	1	22
23	8,600	19.7	8,600	8,600	0	1	1	0	0	15.4	4.1	2.2	0	25.1	2	23
24	22,150	49.7	20,500	22,150	0	4	4	0	0	34.9	14.4	11.8	4	68.6	3	24
25	14,000	23.3	1,150	14,000	0	1	1	0	0	16.1	7.1	4.9	1	24.1	2	25
26	14,650	33.6	14,650	14,650	0	2	2	0	0	27.8	5.4	5.2	1	48.6	3	26
27	14,100	32.4	14,100	14,100	0	1	1	0	0	23.1	8.8	9.6	1	43.4	2	27
28	99,650	186.3	47,050	92,900	1	5	7	0	1	88.7	95.7	59.8	6	204.7	10	28
29	9,900	15.9	0	9,900	0	0	0	1	0	10.3	5.7	5.8	1	19.8	0	29
30	21,150	36.4	3,550	21,150	0	2	2	0	0	21.2	14.5	9.1	0	35.6	5	30
31	33,850	75.4	30,550	33,850	0	1	1	0	1	29.9	44.9	21.5	2	74	4	31
32	20,350	39.5	9,850	20,350	0	1	1	7	0	21.6	17.5	6.5	2	38.8	6	32
33	14,850	31.8	11,550	14,850	0	1	1	0	0	18.8	12.7	4.3	2	49.1	2	33
34	6,000	13.8	6,000	6,000	0	1	1	1	0	3.3	10.2	3.1	0	8.45	0	34
35	5,950	13.7	5,950	5,950	0	0	0	0	0	9.4	4.2	2.4	0	11	2	35
36	3,350	7.7	3,350	3,350	0	0	0	0	0	4.8	2.8	0.3	0	11	1	36
37	5,950	9.6	0	5,950	0	0	0	0	0	4.3	5.3	3.7	0	6	1	37
38	7,450	17.1	7,450	7,450	0	0	0	2	0	11.4	5.7	2.5	0	24.1	3	38
39	10,500	21.5	9,300	8,550	0	0	0	0	0	10.8	9.9	4.2	1	22.6	6	39
40	7,950	12.8	0	7,950	0	0	0	0	0	1.8	10.6	5.7	0	8.3	1	40
41	9,100	14.6	0	9,100	0	0	0	0	0	7.2	7.4	1.8	1	13.3	1	41
42	500	0.8	0	500	0	0	0	0	0	0.8	0.0	0.0	0	0.6	2	42

z: Used when different combinations of segments results in additional angles for particular routes.

Table 4-6
Route Components

Route	Route Components
Western Alternatives (Segments 1 - 15)	
A1	1,3,7z,9,12,15
A2	1,3,7z,9,10,14
A3	1,3,7z,9,10,13,15
A4	1,3,7,8,11,13,15
A5	1,3,7,8,11z,14
A6	1,3,5,6,9,12,15
A7	1,3,5,6,9,10,14
A8	1,3,5,6,9,10,13,15
A9	1,3,5,6z,8,11,13,15
A10	1,3,5,6z,8,11z,14
A11	1,4,6,9,12,15
A12	1,4,6,9,10,14
A13	1,4,6,9,10,13,15
A14	1,4,6z,8,11,13,15
A15	1,4,6z,8,11z,14
A16	2,11,13,15
A17	2,11z,14
Eastern Alternatives (Segments 16-42)	
B1	16,18,28,41,42
B2	16,18,24,26,32,37,40,41,42
B3	16,18,24,26,30,32,37,38,39,42
B4	16,18,24,26,30,32,35,36,39,42
B5	16,18,24,26,30,33,34,36,39,42
B6	16,18,24,26,30,33,34,35,37,40,41,42
B7	16,18,24,26,30,33,34,36,38,40,41,42
B8	16,18,24,26,29,31,34,36,39,42
B9	16,18,24,26,29,31,34,35,37,40,41,42
B10	16,18,24,26,29,31,34,36,38,40,41,42
B11	16,19,22,23,34,38,41,42
B12	16,19,22,23,26,30,32,37,40,41,42
B13	16,19,22,23,26,30,32,37,38,39,42
B14	16,19,22,23,26,30,32,35,36,39,42

Route	Route Components
B15	16,19,22,23,26,30,33,34,36,39,42
B16	16,19,22,23,26,30,33,34,35,37,40,41,42
B17	16,19,22,23,26,30,33,34,36,38,40,41,42
B18	16,19,22,23,26,29,31,34,36,39,42
B19	16,19,22,23,26,29,31,34,35,37,40,41,42
B20	16,19,22,23,26,29,31,34,36,38,40,41,42
B21	16,19,22,25,27,31,34,36,39,42
B22	16,19,22,25,27,31,34,35,37,40,41,42
B23	16,19,22,25,27,31,34,36,38,40,41,42
B24	17,20,22,23,24,28,41,42
B25	17,20,22,23,26,30,32,37,40,41,42
B26	17,20,22,23,26,30,32,37,38,39,42
B27	17,20,22,23,26,30,32,35,36,39,42
B28	17,20,22,23,26,30,33,34,36,39,42
B29	17,20,22,23,26,30,33,34,35,37,40,41,42
B30	17,20,22,23,26,30,33,34,36,38,40,41,42
B31	17,20,22,23,26,29,31,34,36,39,42
B32	17,20,22,23,26,29,31,34,35,37,40,41,42
B33	17,20,22,23,26,29,31,34,36,38,40,41,42
B34	17,20,22,25,27,31,34,36,39,42
B35	17,20,22,25,27,31,34,35,37,40,41,42
B36	17,20,22,25,27,31,34,36,38,40,41,42
B37	17,21,27,31,34,36,39,42
B38	17,21,27,31,34,35,37,40,41,42
B39	17,21,27,31,34,36,38,40,41,42

Table 4-7
Route Data

Route	Total Length (ft.)	New ROW (acs.)	Length Not Parallel Existing Transmission (ft.)	Length Not Parallel Gas Pipelines (ft.)	Residences within 100 ft.	Residences within 200 ft.	Residential Proximity Score	Businesses within 200 ft.	Public Facilities within 200 ft.	Cleared / Agricultural Land Crossed (acres)	Woodland Crossed (acres)	Wetlands Crossed (acres)	Perennial Streams Crossed (number)	Visibility Rating	Heavy Angles (number)	Route
A1	80,850	148.8	71,300	47,950	0	1	1	0	0	60.7	86.8	16.0	3	182.7	12	A1
A2	79,900	165.8	70,350	67,900	0	1	1	0	0	61.5	102.3	33.6	1	176.8	10	A2
A3	84,250	157.0	69,500	55,650	0	1	1	0	0	60.5	94.8	22.3	3	190.3	12	A3
A4	85,500	157.5	52,800	67,750	0	4	4	0	0	55.8	100.2	20.9	3	168.5	9	A4
A5	81,150	166.3	53,650	80,000	0	4	4	0	0	56.7	107.6	32.2	1	155.0	8	A5
A6	69,150	129.6	69,150	37,400	0	1	1	0	0	42.1	87.2	17.3	4	143.7	13	A6
A7	68,200	146.6	68,200	57,350	0	1	1	0	0	42.9	102.7	34.9	2	137.8	11	A7
A8	72,550	137.8	67,350	45,100	0	1	1	0	0	41.9	95.2	23.6	4	151.3	13	A8
A9	73,800	138.2	50,650	57,200	0	4	4	0	0	37.2	100.6	22.1	4	129.5	12	A9
A10	69,450	147.1	51,500	69,450	0	4	4	0	0	38.2	108.0	33.5	2	116.0	11	A10
A11	68,250	127.5	68,250	36,500	0	0	0	0	0	49.0	77.6	19.1	4	137.9	14	A11
A12	67,300	144.5	67,300	56,450	0	0	0	0	0	49.8	93.1	36.7	2	132.0	12	A12
A13	71,650	135.7	66,450	44,200	0	0	0	0	0	48.8	85.7	25.4	4	145.5	14	A13
A14	72,900	136.2	49,750	56,300	0	3	3	0	0	44.1	91.1	24.0	4	123.7	13	A14
A15	68,550	145.0	50,600	68,550	0	3	3	0	0	45.1	98.5	35.3	2	110.2	12	A15
A16	55,550	92.0	26,100	38,950	1	5	7	1	0	49.6	41.1	19.0	3	128.6	13	A16
A17	51,200	100.8	26,950	51,200	1	5	7	1	0	50.6	48.5	30.3	1	115.1	12	A17
B1	155,750	295.8	75,150	149,000	1	5	7	0	2	140.7	152.1	97.8	11	319.2	17	B1
B2	148,900	291.1	76,650	148,900	0	9	9	7	1	163.7	124.2	80.1	12	320.4	26	B2
B3	149,200	302.3	93,400	147,250	0	9	9	9	1	176.9	121.8	79.3	12	345.5	33	B3
B4	145,100	297.0	95,250	143,150	0	9	9	7	1	175.5	117.7	75.8	12	337.4	32	B4
B5	139,650	289.4	97,000	137,700	0	10	10	1	1	166.6	119.0	74.3	12	345.2	26	B5
B6	154,750	310.9	90,300	154,750	0	10	10	1	1	173.7	133.9	83.3	12	350.2	24	B6
B7	153,650	312.4	95,150	153,650	0	10	10	3	1	176.2	132.8	80.0	12	368.3	25	B7
B8	147,400	312.5	112,450	145,450	0	8	8	2	2	166.8	142.3	88.2	13	354.3	23	B8
B9	162,500	334.0	105,750	162,500	0	8	8	2	2	173.8	157.2	97.3	13	359.3	21	B9
B10	161,400	335.5	110,600	161,400	0	8	8	4	2	176.4	156.2	94.0	13	377.4	22	B10
B11	178,050	344.8	94,150	171,300	1	13	15	0	2	188.2	153.4	94.6	15	389.0	25	B11
B12	126,300	240.6	54,650	126,300	0	9	9	7	1	141.4	96.5	53.2	8	253.0	28	B12
B13	127,200	251.8	71,400	125,250	0	9	9	9	1	154.5	94.2	52.4	8	278.1	35	B13
B14	123,100	246.5	73,250	121,150	0	9	9	7	1	153.1	90.1	48.9	8	270.0	34	B14
B15	117,650	238.9	75,000	115,700	0	10	10	1	1	144.2	91.3	47.4	8	277.8	28	B15
B16	132,750	260.4	68,300	132,750	0	10	10	1	1	151.3	106.3	56.4	8	282.8	26	B16
B17	131,650	261.9	73,150	131,650	0	10	10	3	1	153.8	105.2	53.1	8	300.9	27	B17
B18	125,400	262.0	90,450	123,450	0	8	8	2	2	144.4	114.7	61.3	9	286.9	25	B18
B19	140,500	283.5	83,750	140,500	0	8	8	2	2	151.5	129.6	70.4	9	291.9	23	B19
B20	139,400	285.0	88,600	139,400	0	8	8	4	2	154.0	128.5	67.1	9	310.0	24	B20
B21	120,350	248.4	82,450	118,400	0	7	7	1	2	130.1	115.4	62.6	9	260.9	24	B21
B22	135,450	269.8	75,750	135,450	0	7	7	1	2	137.1	130.3	71.7	9	265.9	22	B22
B23	134,350	271.4	80,600	134,350	0	7	7	3	2	139.7	129.2	68.4	9	284.0	23	B23
B24	175,800	353.4	111,550	169,050	1	10	12	0	1	188.7	162.1	90.9	13	412.6	21	B24
B25	124,050	249.2	72,450	124,050	0	6	6	7	0	141.9	105.2	49.5	6	276.6	24	B25
B26	124,950	260.4	89,200	123,000	0	6	6	9	0	155.0	102.9	48.7	6	301.7	31	B26
B27	120,850	255.1	91,050	118,900	0	6	6	7	0	153.6	98.8	45.2	6	293.6	30	B27
B28	115,400	247.6	92,800	113,450	0	7	7	1	0	144.7	100.0	43.6	6	301.4	24	B28
B29	130,500	269.0	86,100	130,500	0	7	7	1	0	151.8	115.0	52.7	6	306.4	22	B29
B30	129,400	270.6	90,950	129,400	0	7	7	3	0	154.3	113.9	49.4	6	324.5	23	B30
B31	123,150	270.7	108,250	121,200	0	5	5	2	1	144.9	123.4	57.6	7	310.5	21	B31
B32	138,250	292.1	101,550	138,250	0	5	5	2	1	152.0	138.3	66.7	7	315.5	19	B32
B33	137,150	293.7	106,400	137,150	0	5	5	4	1	154.5	137.2	63.4	7	333.6	20	B33
B34	118,100	257.0	100,250	116,150	0	4	4	1	1	130.6	124.1	58.9	7	284.5	20	B34
B35	133,200	278.5	93,550	133,200	0	4	4	1	1	137.6	139.0	68.0	7	289.5	18	B35
B36	132,100	280.1	98,400	132,100	0	4	4	3	1	140.2	137.9	64.6	7	307.6	19	B36
B37	123,600	278.5	118,600	121,650	0	3	3	1	1	137.2	138.5	75.0	6	303.7	19	B37
B38	138,700	300.0	111,900	138,700	0	3	3	1	1	144.3	153.4	84.1	6	308.7	17	B38
B39	137,600	301.5	116,750	137,600	0	3	3	3	1	146.8	152.3	80.8	6	326.8	18	B39

Table 4-8
Sorted Weighted Scores

Weights:	1	10	8	13	4	9	13	7	5	3	10	2		
Z-Scores	Total Length (ft.)	Length Not Parallel Existing Transmission (ft.)	Length Not Parallel Gas Pipelines (ft.)	Residential Proximity Score	Businesses within 200 ft.	Public Facilities within 200 ft.	Cleared / Agricultural Land Crossed (acres)	Woodland Crossed (acres)	Wetlands Crossed (acres)	Perennial Streams Crossed (number)	Visibility Rating	Heavy Angles (number)	TOTAL	Z-Scores
A6	-0.3	8.0	-11.3	-8.4	-1.4	0.0	-11.7	-0.9	-6.4	3.2	0.0	1.4	-27.7	A6
A11	-0.4	7.4	-11.8	-14.2	-1.4	0.0	-0.1	-4.4	-5.1	3.2	-2.4	2.7	-26.6	A11
A16	-1.8	-22.0	-10.3	26.0	10.6	0.0	0.8	-18.1	-5.2	0.6	-6.3	1.4	-24.1	A16
A9	0.2	-4.9	1.3	8.8	-1.4	0.0	-19.9	4.2	-2.9	3.2	-5.9	0.2	-17.1	A9
A14	0.1	-5.5	0.7	3.0	-1.4	0.0	-8.4	0.6	-1.6	3.2	-8.3	1.4	-16.1	A14
A17	-2.2	-21.4	-2.5	26.0	10.6	0.0	2.5	-15.3	2.9	-4.6	-11.9	0.2	-15.8	A17
A8	0.1	6.8	-6.4	-8.4	-1.4	0.0	-12.0	2.1	-1.9	3.2	3.1	1.4	-13.4	A8
A13	0.0	6.1	-7.0	-14.2	-1.4	0.0	-0.5	-1.4	-0.6	3.2	0.7	2.7	-12.3	A13
A10	-0.3	-4.3	9.1	8.8	-1.4	0.0	-18.2	6.9	5.1	-2.0	-11.5	-1.0	-8.8	A10
A15	-0.4	-4.9	8.5	3.0	-1.4	0.0	-6.7	3.4	6.4	-2.0	-13.9	0.2	-7.7	A15
A7	-0.4	7.4	1.4	-8.4	-1.4	0.0	-10.4	4.9	6.2	-2.0	-2.5	-1.0	-6.2	A7
A12	-0.5	6.7	0.8	-14.2	-1.4	0.0	1.2	1.4	7.5	-2.0	-4.9	0.2	-5.2	A12
A1	1.0	9.5	-4.6	-8.4	-1.4	0.0	19.4	-1.0	-7.3	0.6	16.1	0.2	24.2	A1
A4	1.5	-3.4	8.0	8.8	-1.4	0.0	11.2	4.0	-3.8	0.6	10.2	-3.5	32.2	A4
A3	1.4	8.3	0.3	-8.4	-1.4	0.0	19.1	2.0	-2.8	0.6	19.3	0.2	38.5	A3
A5	1.0	-2.8	15.7	8.8	-1.4	0.0	12.9	6.8	4.2	-4.6	4.6	-4.7	40.6	A5
A2	0.9	8.9	8.1	-8.4	-1.4	0.0	20.7	4.8	5.3	-4.6	13.7	-2.2	45.6	A2
B25	-0.9	-12.4	-6.4	-7.5	5.6	-15.5	-10.4	-6.9	-5.8	-3.3	-10.1	0.0	-73.6	B25
B28	-1.4	1.1	-12.2	-2.5	-3.1	-15.5	-8.0	-8.7	-7.7	-3.3	-3.3	0.0	-64.6	B28
B34	-1.2	6.1	-10.7	-17.5	-3.1	-1.8	-20.0	-0.4	-2.9	-2.2	-7.9	-1.7	-63.5	B34
B12	-0.7	-24.2	-5.2	7.6	5.6	-1.8	-10.8	-10.0	-4.7	-1.0	-16.5	1.7	-60.0	B12
B15	-1.3	-10.7	-10.9	12.6	-3.1	-1.8	-8.4	-11.8	-6.5	-1.0	-9.7	1.7	-50.9	B15
B27	-1.1	0.0	-9.2	-7.5	5.6	-15.5	-0.5	-9.2	-7.2	-3.3	-5.4	2.5	-50.7	B27
B21	-1.1	-5.7	-9.5	-2.5	-3.1	12.0	-20.4	-3.4	-1.7	0.1	-14.3	0.0	-49.8	B21
B29	-0.4	-3.3	-3.0	-2.5	-3.1	-15.5	-2.0	-3.6	-4.8	-3.3	-1.9	-0.9	-44.3	B29
B35	-0.3	1.6	-1.5	-17.5	-3.1	-1.8	-14.0	4.8	-0.1	-2.2	-6.5	-2.6	-43.2	B35
B26	-0.8	-1.3	-7.0	-7.5	8.5	-15.5	0.7	-7.8	-6.1	-3.3	-3.2	3.0	-40.2	B26
B14	-0.9	-11.8	-8.0	7.6	5.6	-1.8	-0.9	-12.2	-6.0	-1.0	-11.9	4.3	-37.1	B14
B37	-0.9	18.2	-7.7	-22.6	-3.1	-1.8	-14.4	4.6	2.2	-3.3	-2.7	-2.2	-33.6	B37
B30	-0.5	-0.1	-3.5	-2.5	-0.2	-15.5	0.2	-3.9	-5.9	-3.3	3.0	-0.5	-32.7	B30
B36	-0.3	4.8	-2.1	-17.5	-0.2	-1.8	-11.9	4.4	-1.1	-2.2	-1.6	-2.2	-31.6	B36
B16	-0.3	-15.1	-1.7	12.6	-3.1	-1.8	-2.4	-6.6	-3.7	-1.0	-8.4	0.8	-30.6	B16
B31	-0.9	11.4	-8.0	-12.5	-1.7	-1.8	-7.9	-0.6	-3.3	-2.2	-0.8	-1.3	-29.6	B31
B22	-0.1	-10.2	-0.3	-2.5	-3.1	12.0	-14.4	1.8	1.1	0.1	-13.0	-0.9	-29.5	B22
B13	-0.7	-13.1	-5.8	7.6	8.5	-1.8	0.3	-10.8	-4.9	-1.0	-9.6	4.7	-26.6	B13
B17	-0.4	-11.9	-2.3	12.6	-0.2	-1.8	-0.3	-7.0	-4.7	-1.0	-3.4	1.3	-19.1	B17
B23	-0.2	-7.0	-0.9	-2.5	-0.2	12.0	-12.3	1.4	0.1	0.1	-8.0	-0.5	-18.0	B23
B18	-0.8	-0.4	-6.8	2.6	-1.7	12.0	-8.3	-3.7	-2.1	0.1	-7.3	0.4	-16.0	B18
B38	0.1	13.8	1.5	-22.6	-3.1	-1.8	-8.4	9.8	5.0	-3.3	-1.3	-3.0	-13.4	B38
B32	0.1	6.9	1.2	-12.5	-1.7	-1.8	-1.9	4.5	-0.4	-2.2	0.5	-2.2	-9.3	B32
B39	0.0	17.0	0.9	-22.6	-0.2	-1.8	-6.2	9.4	4.0	-3.3	3.6	-2.6	-1.8	B39
B33	0.0	10.1	0.6	-12.5	1.2	-1.8	0.3	4.2	-1.5	-2.2	5.5	-1.7	2.2	B33
B19	0.2	-4.9	2.4	2.6	-1.7	12.0	-2.3	1.5	0.7	0.1	-5.9	-0.5	4.3	B19
B1	1.2	-10.6	7.0	-2.5	-4.6	12.0	-11.4	9.3	9.3	2.3	1.6	-3.0	10.8	B1
B20	0.1	-1.7	1.8	2.6	1.2	12.0	-0.1	1.2	-0.3	0.1	-1.0	0.0	15.9	B20
B2	0.7	-9.6	6.6	7.6	5.6	-1.8	8.1	-0.4	-3.8	3.5	1.9	0.8	27.0	B2
B5	0.2	3.9	0.9	12.6	-3.1	-1.8	10.6	-2.2	1.9	3.5	8.7	0.8	36.0	B5
B4	0.5	2.7	3.9	7.6	5.6	-1.8	18.1	-2.6	2.4	3.5	6.5	3.4	49.9	B4
B6	1.1	-0.5	10.1	12.6	-3.1	-1.8	16.6	3.0	4.8	3.5	10.0	0.0	56.3	B6
B3	0.8	1.5	6.1	7.6	8.5	-1.8	19.3	-1.2	3.5	3.5	8.7	3.8	60.4	B3
B7	1.1	2.7	9.5	12.6	-0.2	-1.8	18.7	2.6	3.7	3.5	15.0	0.4	67.9	B7
B8	0.7	14.1	5.1	2.6	-1.7	12.0	10.7	5.9	6.3	4.6	11.1	-0.5	71.0	B8
B9	1.6	9.7	14.3	2.6	-1.7	12.0	16.7	11.1	9.2	4.6	12.5	-1.3	91.3	B9
B10	1.6	12.9	13.7	2.6	1.2	12.0	18.8	10.7	8.1	4.6	17.4	-0.9	102.8	B10
B24	2.5	13.8	17.8	22.7	-4.6	-1.8	29.4	12.8	7.2	4.6	27.1	-1.3	130.1	B24
B11	2.6	2.0	19.1	37.8	-4.6	12.0	28.9	9.8	8.3	6.9	20.6	0.4	143.8	B11

4.4.3.1 Selection Of An "A" Route

Routes A1 through A5 received the highest (most impacting) scores of all the "A" routes. They are the only routes that use Segment 7. This segment takes the most circuitous route west out of the Darlington County Plant before turning back east toward Florence. Because the segment is so much longer than the other options in this area and does not parallel an existing utility corridor, it also has the most agricultural land, woodland and wetlands crossed, and the highest visibility, all of which contribute to the poor scores of routes A1 through A5. These routes were eliminated from consideration.

The next highest-impacting routes include Routes A12, A7, A15 and A10. These routes, along with Route A17 that ranked somewhat better, all use Segment 14 instead of Segment 15. Segment 14 is along entirely new right-of-way, whereas Segment 15 follows a gas pipeline for most of its length. As a result, Segment 14 impacts more woodland and wetland than its alternative (Segment 15), thereby causing these routes to be ranked somewhat lower in the route comparison than those using Segment 15. These routes also tended to have higher agricultural/cleared land impacts or residential impacts, criteria that were of high public concern. These criteria, when combined, made these routes less desirable. Consequently, they were dropped from further consideration.

The remaining routes (A8, A9, A13, and A14) have several segments in common. These routes have no major impacts in any one category that causes them to have high scores. Rather, these routes are slightly higher in several categories relative to the lowest-scoring routes. In particular, Routes A8 and A13 scored relatively poorer in length along existing corridors, woodland, wetlands and visibility. Routes A9 and A14 showed a little more variation, with a lower score for following existing transmission lines offset by a higher residential score. Otherwise, the cumulative effect in other categories was similar to Routes A8 and A13. The combination of aforementioned features resulted in lower scores and the elimination of these routes from consideration.

For this analysis, the top routes were considered to be those within 20 percent of the lowest score. The only remaining route that did not score within 20 percent of the top route is Route A17. As mentioned previously, Route A17 was affected by the use of Segment 14. Though Route A17 had low scores in some categories, its high residential impacts and moderately high wetland and agricultural impacts outweighed these benefits and reduced the overall score for this route to the point where it was not considered one of the top routes.

The remaining routes, Routes A6, A11, and A16, received the top scores of the "A" routes and were all within 20 percent of the lowest score. Less than 4 points separate the scores of the best route, A6, and the third route, A16. The top two routes, A6 and A11, are nearly identical, so it is reasonable that these two should have similar scores. Route A6 uses Segments 3 and 5, while Route A11 uses Segment 4. Route A6 ranked slightly better than Route A11 in part because A6 crosses less agricultural land, and the rest of the categories are close enough that they do not change the overall outcome. Route A16 had significant variation in scores between categories that resulted in a low overall score. This route had the highest number of houses and the only business among the alternatives. Refer to Section 4.4.3.1.2 for a more detailed discussion of Route A16.

The top ranking routes do not necessarily rank the lowest for every routing factor, but the overall impacts of these routes when compared to the others are the lowest.

4.4.3.1.1 Preferred "A" Route

Several key issues were considered in the selection of the preferred "A" route, including residential impact and agricultural land crossed. These were the issues ranked the most important by the public. Route A6 crosses within 200 feet of only one house and impacts some of the fewest acres of agricultural land of any of the routes. It also has few wetland impacts and follows nearly the most gas pipeline corridor, which reduces impacts to many of the other factors because the least amount of new right-of-way would be affected. Route A6 parallels less existing transmission line right-of-way than many of the other "A" Routes because it follows the gas pipeline corridor.

While Route A6 crosses the most streams and has nearly the highest number of heavy angles, it has only three additional stream crossings and four additional angle structures compared to the routes with the fewest stream crossings (Routes A2, A5 and A17) and angles (Route A5). As such, Route A6 does not differ significantly from the best routes for these categories. Additionally, these criteria were not considered to be as significant as homes and agricultural land crossed. Impacts to streams from transmission lines are typically minimal because the transmission line would be constructed to span them (see Chapter 5.0 and 6.0). Angle structures drive up the cost of the project but this was an issue of relatively low importance to the public. Angle structures are also generally more visible than tangent structures.

While Route A6 did not have the absolute lowest score for any of the routing factors, it did not have the highest score for any of them either. In addition, most of its values were among the lowest scores of all

the routes (total length, length not parallel gas pipeline, residential proximity score, businesses impacted, and agricultural, woodland and wetlands crossed). When all factors are considered cumulatively, Route A6 would have the least overall impact. No unquantifiable or intangible constraints are present along this route. Thus, Route A6 was selected as the preferred route. Its components are Segments 1, 3, 5, 6, 9, 12, and 15.

The preferred "A" route would begin heading west out of the Darlington County Plant, crossing West Bobo Newsome Highway and Rancho Road before turning south. It would then cross West Old Camden Road and Clyde School Road before joining the existing SCANA gas pipeline near McKenzie Road. While paralleling the gas pipeline, the route would cross Bellview Drive, Kelly Bridge Road, Liberty Hill Road, Timberline Drive and Woodduck Road before crossing CP&L's existing Darlington County Plant to Sumter 230-kV transmission line, Sparrow Swamp Road and Possum Bay Road. The route would then diverge from the gas pipeline and turn east, crossing Wesley Chapel Road and the South Carolina Central rail line before ending at the intersection of Segments 14, 15, 16 and 17, approximately one mile northwest of the intersection of U.S. Highway 15, S.C. 34, and S.C. 403.

4.4.3.1.2 Alternate "A" Route

An alternate route was identified to offer a variation from the preferred route in case unforeseen issues arise with the preferred route that preclude it from being constructed. Any of the top three routes could be selected because of the similarity in their scores. However, only Route A16 provides an option in significant contrast to the preferred route. Route A11 differs from Route A6 in only one segment. Should an issue arise only along Segments 3 or 5 of the preferred route, Route A11 could be constructed without resulting in a significant difference from the preferred route. However, if an issue arose on another segment along the preferred route, neither the preferred route nor Route A11 could be constructed. Route A16 was therefore selected as the alternate route to provide a significantly different location.

The components of Route A16 are: Segments 2, 11, 13 and 15. It would exit to the south from the Darlington County Plant along the existing Darlington County Plant to Robinson transmission line. It would then follow an abandoned railroad bed to the existing Darlington County Plant to Sumter 230-kV transmission line, which it would parallel due south to the existing gas pipeline. From this point, Route A16 would use Segment 15, the same as the preferred route.

Route A16 is one of the shortest, follows the most existing transmission line right-of-way and nearly the most gas pipeline corridor, and impacts the least woodland and few wetlands. However, Route A16 crosses within 200 feet of five homes and within 100 feet of another. It also crosses within 200 feet of a business and would require multiple angles to be constructed along the abandoned railroad bed between the existing transmission lines north of Highway 151.

An issue not reflected in the routing analysis is the difficulty in crossing CP&L's Category 1 transmission lines exiting from the Robinson Plant. Route A16 crosses a Category 1 line just before it meets the Darlington County Plant to Sumter transmission line. When a new transmission line is constructed across an existing line, it is generally safer and more appropriate to take the existing line out of service. The Category 1 transmission lines could not be easily taken out of service because there are no other existing lines available to carry the transferred load from these lines. It is feasible, but more difficult, to construct the new line with the existing lines still in service.

4.4.3.2 Selection of a "B" Route

Of the 39 alternatives, the poorest scoring routes, Routes B1 through B11 and B24 all used Segment 24 or Segment 28. These segments are the most circuitous options for reaching the Florence Substation, angling north of Darlington, rather than south like the other alternatives. These routes are some of the longest, follow less existing utility lines than the average, and have some of the greatest impacts to residences and public facilities. Because of their significantly longer lengths, they also have more agricultural, woodland and wetland impacts, cross the most streams, and have higher visibility than just about all the other alternatives. Though not reflected in the data analysis, Segment 28 also crosses 26,850 feet of a National Register-listed historic plantation where the route parallels the existing Robinson Plant to Florence 230-kV transmission line. For these reasons, these routes were eliminated from consideration.

In general, routes that used Segments 29, 35 and 38 tended to rank poorer than more direct routes. These routes include B13, B14, B16 through B20, B22, B23, B26, B27, B29, B30 through B33, B35, B36, B38 and B39. Routes using these segments typically did some backtracking to avoid constraints. For example, routes using Segment 29 would head south, only to head back north on Segments 31, 34, and also possibly Segments 35 or 38. These segments were developed in case issues were identified along the more direct options that made them infeasible. Backtracking creates additional length resulting in additional impacts to agriculture, woodland and wetland, and increases the opportunity to have greater

residential and visibility impacts as well. Because no exceptionally problematic issues along the more direct options were identified, the alternatives using Segments 29, 35, and 38 did not score well.

The only remaining routes that were not within 20 percent of the lowest score are Routes B15 and B21. Like many of the other lower-scoring routes, Route B21 uses Segment 31. This segment generally caused routes using it to rank poorer than routes using the alternative, Segment 30, because Segment 31 would require an entirely new right-of-way. Segment 30 parallels an existing transmission corridor and is slightly more direct. Segment 31 also had a relatively high visibility impact and crossed high amounts of woodland and wetland. Route B15 is identical to the second-best route (Route B28), except it uses Segments 16 and 19 in place of Segments 17 and 20. The route ranked poorer than B28 because Segment 16 passes within 200 feet of three houses and one public facility, outweighing the benefits of paralleling the existing transmission line along Segment 19. Segments 17 and 20 do not impact any residences or public facilities within 200 feet.

The remaining routes, Routes B25, B28, B34 and B12, received the top scores of the "B" routes and were all within 20 percent of the lowest score (Route B25). The top ranking routes do not necessarily rank the best for every routing factor, but the overall impacts of these routes when compared to the others are the lowest.

Routes B12 and B34 were not selected as either the preferred or alternate route. Route B12 is identical to the top-scoring route, except that it uses Segments 16 and 19. Like Route B15, it did not score as well because Segment 16 impacts three houses and a public facility. The other top routes use Segments 17 and 20, which do not impact these features. Of the top four routes, Route B12 was the longest, had the highest residential proximity score, the most impacted businesses and public facilities, the most perennial streams crossed, and the most angles greater than 30 degrees. For these reasons, Route B12 is not preferable to the other top routes.

Route B34 uses Segment 31 with Segments 25 and 27. This combination of segments results in slightly more backtracking for this route than the two higher-scoring routes. Segment 31 is also entirely along new right-of-way, contrasting with the entire length of its primary alternative (Segment 30), which parallels an existing transmission line. Segment 30 is part of Routes B25 and B28. These criteria were enough to allow Routes B25 and B28 to surpass Route B34 in the analysis.

4.4.3.2.1 Preferred "B" Route

Though Route B25 did not score the lowest in every category, its overall score was at least nine points better than the other routes. Most of the values for the evaluated criteria for Route B25 were among the lowest of all the routes. The route parallels existing transmission corridors for 42 percent of its length, and has a relatively low impact to residences (6), public facilities (0), agricultural land (141.9 acres), woodland (105.2 acres), wetlands (49.5 acres) and perennial streams (6). It also has a low visibility impact (276.6), which was considered an important issue to the public. The residential impact is only two homes more than Route B34, which had the lowest residential impact. All the homes along Route B25 would be at least 101-200 feet from the route. Furthermore, half of the homes impacted by Route B25 are located where the new line parallels an existing transmission line. In each case, the new transmission line would be located on the opposite side of the existing line from the homes.

Route B25 was selected as the preferred route because it minimizes impacts to all evaluated criteria. Its components are Segments 17, 20, 22, 23, 26, 30, 32, 37, 40, 41 and 42. The preferred route would begin where the preferred "A" route ends, heading southeast across Highway 15 / 34 and S.C. 403. From there it would angle almost due east, crossing Cherokee Lady Street, Calvary Road and Bethel Road before meeting the existing Robinson Plant to SCPSA Darlington 230-kV transmission line. The route would not parallel this existing line, instead it would angle south and then back to the east around several houses located near the existing line on Indian Branch Road. The route would continue east, crossing Birdsnest Road, South Center Road, Potato House Road, Iseman Road, and U.S. Highway 401. It would cross a corridor of existing transmission lines, including the existing Florence to SCPSA Darlington 230-kV transmission line, before meeting and paralleling Santee-Cooper's transmission line heading east out of the Darlington SCPSA Substation. Along this transmission line, the preferred route would cross High Hill Drive, S.C. 340 and Anderson Farm Road before angling to the north parallel to and east of another existing transmission line corridor. Along this corridor, the preferred route would cross Ebenezer Road and U.S. Highway 52 before turning east, away from the existing transmission line. In this area, the new line must navigate around both residential and commercial developments where it would cross Palmetto Road. It would then angle north, crossing CP&L's Robinson Plant to Florence 115-kV transmission line and the abandoned Seaboard railroad and paralleling another utility's existing transmission line along the Florence / Darlington County line to CP&L's existing Robinson Plant to Florence 230-kV corridor. The preferred route would parallel this transmission line south into the Florence Substation.

4.4.3.2.2 Alternate "B" Route

An alternate route was identified to offer a variation from the preferred route in case unforeseen issues were to arise with the preferred route that would preclude it from being constructed. Any of the remaining three routes could be selected as the alternate because of the similarity in their scores. Because Route B28 ranked second and there were no significant constraints along this route to warrant the selection of one of the other top routes, it was selected as the alternate to the preferred. Its components are Segments 17, 20, 22, 23, 26, 30, 33, 34, 36, 39 and 42.

The alternate route, Route B28, is the shortest of the top routes (21.8 miles) and impacts only one residence more than the preferred, few businesses and public facilities, and relatively low woodland and wetland acres and perennial streams. Its visibility rating is the highest of the top-scoring routes (301.4), but it is still less than the average for all the routes. The first half of this route is identical to the preferred route, so if an issue arose along this portion of the route, another of the top routes would need to be selected. Route B34 would be a reasonable choice if such a need arose. It had the lowest residential and agricultural impact of the top routes.

Route B28 would begin where the selected "A" route ends, then continue east following the same segments as the preferred route, crossing Highway 15 / 34, S.C. 403, Cherokee Lady Street, Calvary Road and Bethel Road before meeting the existing Robinson Plant to SCPSA Darlington transmission line. The route would continue east, crossing Birdsnest Road, South Center Road, Potato House Road, Iseman Road, and U.S. Highway 401, then paralleling Santee-Cooper's transmission line heading east out of the Darlington SCPSA Substation. After crossing High Hill Drive, S.C. 340 and Anderson Farm Road, the route would continue further east along the transmission line right-of-way for about 3,500 feet, then turn southeast to avoid the residential developments along Timberlake Drive and the existing transmission line. The alternate route would cross Turnpike Road and Ebenezer Road before crossing into Florence County. Once in Florence County, Route B28 would cross Pisgah Road and then turn northeast, crossing U.S. Highway 52, before again turning east. The route would then cross Interstate 95, North Cashua Drive and Mechanicsville Road in Florence, then parallel the railroad, gas pipeline and existing transmission line corridor for about 2500 feet to CP&L's Florence to SCPSA Darlington transmission line right-of-way. The alternate route would parallel this line to the east, then south, into the Florence Substation.

4.4.3.3 Overall Preferred Route

The preferred route for the entire project must include both an "A" and "B" route. In this case, the preferred route is the combination of Route A6 with Route B25. The following chapter contains a description of the potential social and environmental impacts related to the proposed project.

5.0 Environmental Impacts of the Proposed Project

5.0 ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

5.1 INTRODUCTION

This section contains a description of the potential environmental effects that could result from the construction, operation, and maintenance of the proposed 230-kV transmission line between the Darlington County Plant and Florence Substation. Potential impacts to both natural and human resources located in the study area are considered.

5.2 DESCRIPTION OF THE PREFERRED AND ALTERNATE ROUTES

All routes begin at the Darlington County Plant located on CP&L property at 4030 Bobo Newsome Highway north of Hartsville. All routes terminate at the Florence Substation located at 1200 N. Douglas Street in Florence.

The evaluation of alternatives resulted in the selection of a preferred and alternate route for the project. Both routes share seven segments. The preferred and alternate routes were identified in Chapter 4.0 from the segment and route data and the routing analysis presented in Tables 4-5, 4-6, and 4-7. Figure 5-1 shows the preferred and alternate routes described in the following sections.

5.2.1 Preferred Route

Following is a description of the preferred route for the proposed transmission line project.

The preferred route includes both a preferred "A" and "B" route. Routes A6 and B25, composed of Segments 1, 3, 5, 6, 9, 12, 15, 17, 20, 22, 23, 26, 30, 32, 37, 40, 41, and 42, were selected as the overall preferred route from the Darlington County Plant to the Florence Substation. This route is approximately 37 miles long (Figure 5-1).

The preferred route leaves the Darlington County Plant heading west toward the Darlington County / Chesterfield County boundary. Near S.R. 16-176 (Substation Road), the preferred route turns south running east of Ashland Road, then crosses Sand Oak Drive, West Old Camden Road, and Clyde School Road. The route turns southeast near McKenzie Road to parallel an existing gas pipeline, which it follows across Kelly Bridge Road in Lee County, Liberty Hill Road, Woodduck Road, Sparrow Swamp Road, and High Point Road in Darlington County. Near Wesley Chapel Road, the preferred route turns

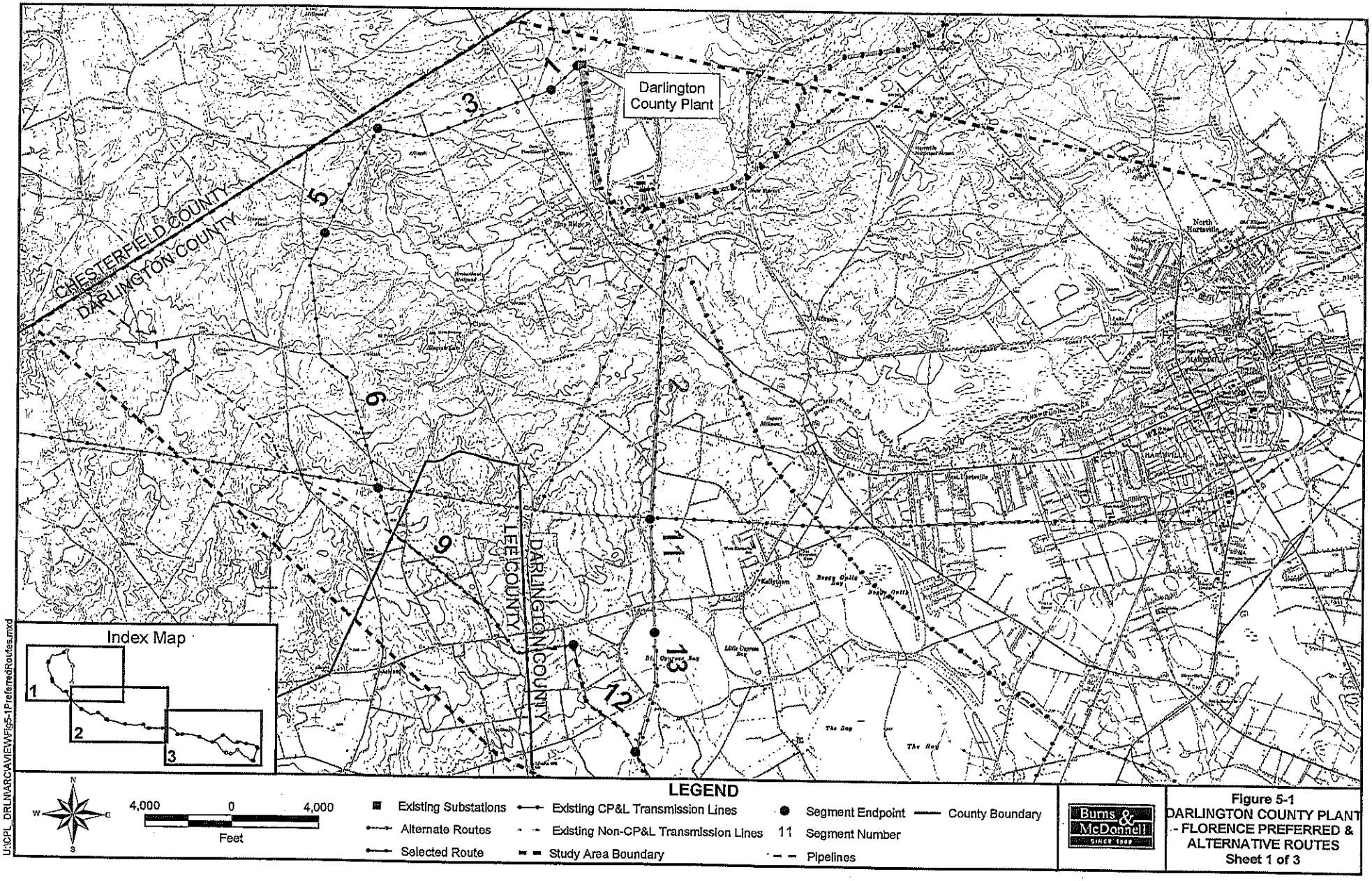

Figure 5-1
DARLINGTON COUNTY PLANT - FLORENCE PREFERRED & ALTERNATIVE ROUTES
Sheet 1 of 3

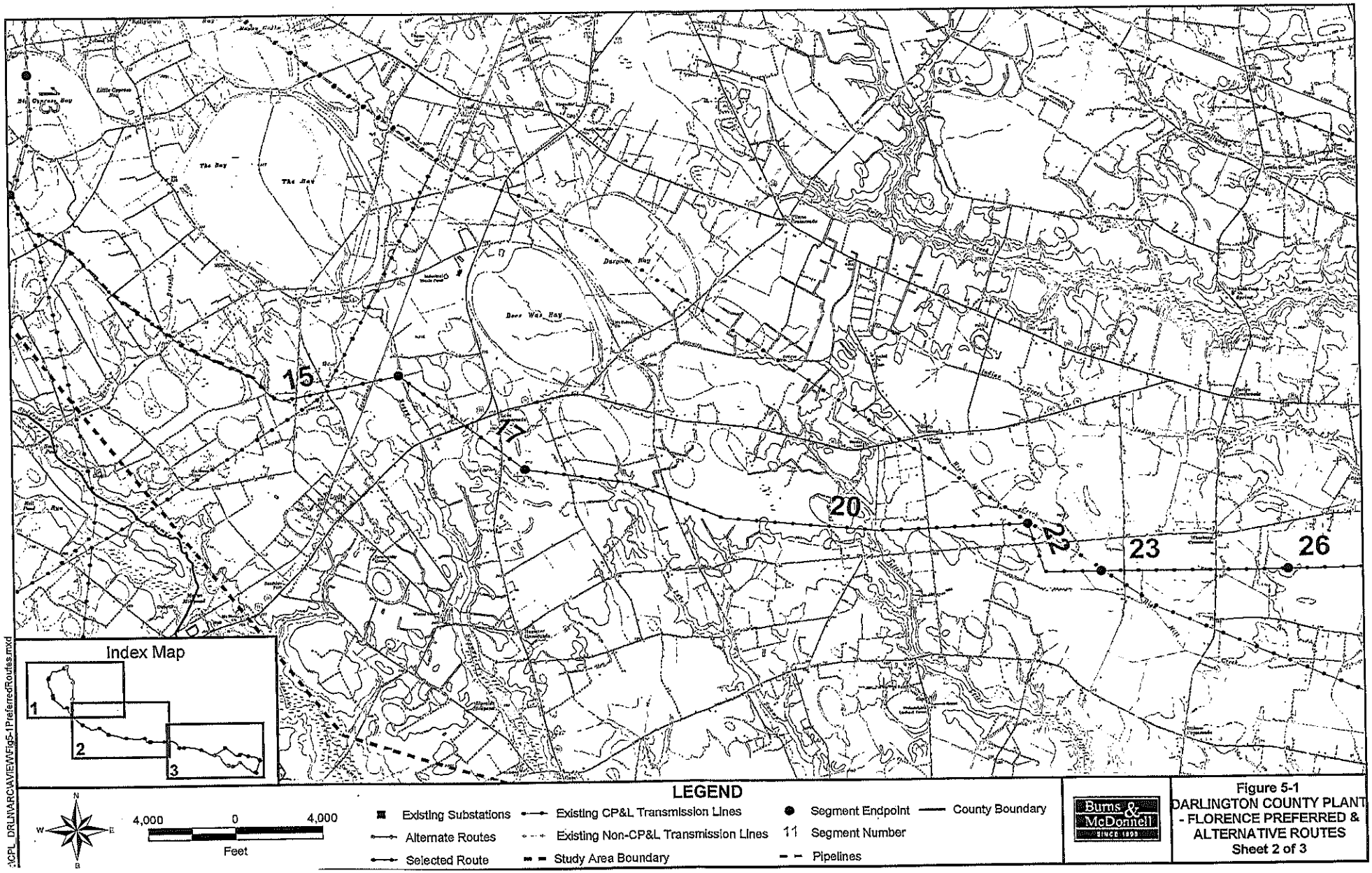

Figure 5-1
DARLINGTON COUNTY PLANT
- FLORENCE PREFERRED &
ALTERNATIVE ROUTES
Sheet 2 of 3

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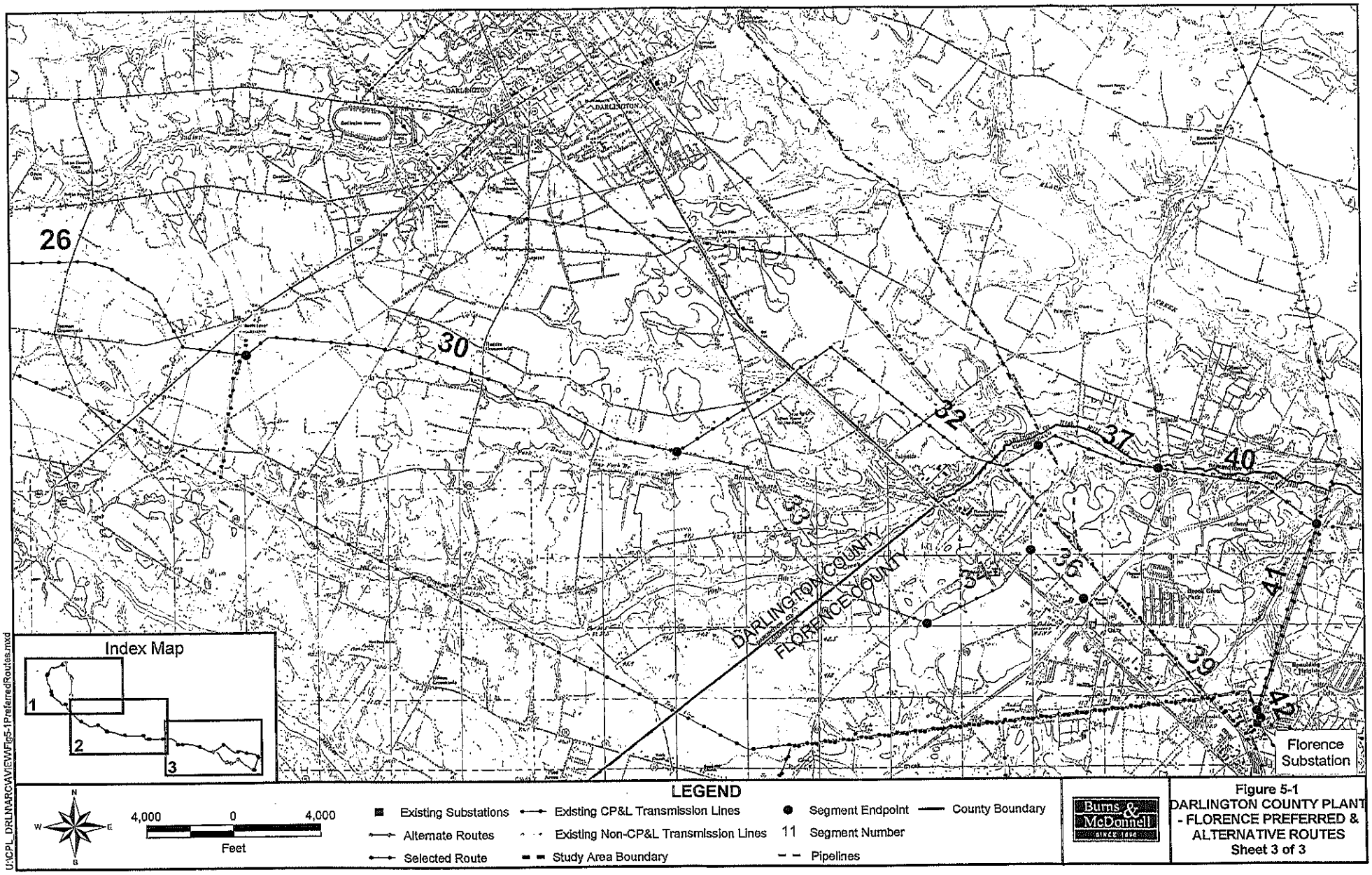

Figure 5-1
DARLINGTON COUNTY PLANT - FLORENCE PREFERRED & ALTERNATIVE ROUTES
Sheet 3 of 3

east for a short distance before again turning southeast, crossing U.S. Highway 15 / S.C. 34 (West Lydia Highway) and S.C. 403. After crossing S.C. 403, the preferred route turns east and crosses Cherokee Lady Street, Calvary Road, and Bethel Road north of Indian Branch Road. The preferred route then meets an existing transmission line, turns south, crossing over Indian Branch Road, then back east to avoid residences near the existing line.

The preferred route crosses the existing line, and continues east across South Center Road and Potato House Road. The route turns south for a short distance crossing, Iseman Road, then continues east, crossing Candleberry Drive, High Hill Road, and S.C. 340 south of Rogers Road. Approximately 0.8 miles west of Ebenezer Road, the preferred route turns northeast, crossing Ebenezer Road and U.S. Highway 52 between Florence and Darlington. Near Cottonfield Lane, the preferred route crosses Palmetto Road and High Hill Creek as it continues southeast into Florence County. The preferred route then heads east along the Darlington County / Florence County boundary. Near Interstate 95, the route turns southeast, then south-southwest as it parallels the existing transmission line to the Florence Substation.

5.2.1.1 Preferred Route Data

Table 5-1 contains a cumulative summary of the data for the preferred route that were described in Chapter 4.0 as "A" and "B" routes. This data is the combined data for routes A6 and B25.

Table 5-1
Preferred Route Summary Data

Routing Criteria	Preferred Route
Total Length (miles)	37
Length Not Parallel Existing Transmission Lines (feet)	141,600
Length Not Parallel Gas Pipelines (feet)	161,450
Residential Proximity Score	7
Businesses within 200 feet (number)	7
Public Facilities within 200 feet (number)	0
Cleared / Agricultural Land Crossed (acres)	184.0
Woodland Crossed (acres)	192.4
Wetland Crossed (acres)	66.8
Perennial Streams Crossed (number)	10
Visibility Rating	420.3
Heavy Angles (number)	37

Approximately 43 percent of the preferred route is parallel to existing gas and transmission lines, thereby minimizing impacts along nearly half of the route. Seven homes are located 101-200 feet from the route. No homes are within 100 feet of the preferred route, and nearly half of the homes within 200 feet are along existing transmission lines, where the homes would generally be located closer to the existing line than the new line. Seven businesses are within 200 feet of the route along Segment 32. All of these businesses are north of Florence near Palmetto Road where few options are available. No public facilities are within 200 feet of the preferred route. The preferred route crosses approximately equal amounts of woodland and cleared land, and impacts relatively few wetlands.

5.2.2 Alternate Route

Following is a description of the alternate to the preferred route for the proposed transmission line project. The overall alternate route is a combination of the selected alternate "A" and "B" routes.

Routes A16 and B28, composed of Segments 2, 11, 13, 15, 17, 20, 22, 23, 26, 30, 33, 34, 36, 39, and 40, comprise the alternate route from the Darlington County Plant to the Florence Substation. This route is approximately 32 miles long (Figure 5-1).

The alternate route leaves the Darlington County Plant heading south parallel to existing CP&L transmission lines. The alternate route turns south from the existing transmission lines, following the abandoned rail bed to the south and east, crossing over a corner of a recycling center. Where it meets several other existing CP&L transmission lines, the alternate route turns south and parallels the existing lines, crossing over S.C. 151 (Bobo Newsome Highway), Westover Drive, Clyde Road, Kelleytown Road, and Kelleybelle Road. South of Kelleybelle Road, the alternate route parallels an existing gas pipeline adjacent to another transmission line corridor. After crossing Sparrow Swamp Road, the route parallels a gas pipeline southeast, past Possum Bay Road and High Point Road. Near Wesley Chapel Road, the route turns east for a short distance before again turning southeast, crossing U.S. Highway 15 / S.C. 34 (West Lydia Highway) and S.C. 403. After crossing S.C. 403, the alternate route turns east across Cherokee Lady Street, Calvary Road, and Bethel Road north of Indian Branch Road. The alternate route then turns south, crossing over Indian Branch Road and back east to avoid residences near the line.

The alternate route continues east, crossing South Center Road, Potato House Road, Iseman Road, Candleberry Drive, High Hill Road, and S.C. 340 south of Rogers Road. Approximately 0.2 miles west of Ebenezer Road, the alternate route turns south and crosses Turnpike Road and the county line. The route then turns east, crossing Pisgah Road, then northeast, crossing U.S. Highway 52 approximately 0.7

miles northwest of Interstate 95. Approximately 0.2 miles northeast of U.S. Highway 52, the alternate route turns southeast, crossing over Interstate 95, then North Douglas Street and Mechanicsville Road. Just east of Mechanicsville Road, the alternate route turns east to follow an existing gas pipeline adjacent to another transmission line corridor to the southeast. The route parallels this corridor to the existing transmission line that heads east then south into the Florence Substation.

5.2.2.1 Alternate Route Data

Table 5-2 contains a summary of the data for the alternate route. This is the combined data for Routes A16 and B28.

Table 5-2
Alternate Route Summary Data

Routing Criteria	Alternate Route
Total Length (miles)	32
Length Not Parallel Existing Transmission Lines (feet)	118,900
Length Not Parallel Gas Pipelines (feet)	152,400
Residential Proximity Score	14
Businesses within 200 feet (number)	2
Public Facilities within 200 feet (number)	0
Cleared / Agricultural Land Crossed (acres)	194.3
Woodland Crossed (acres)	141.1
Wetland Crossed (acres)	62.6
Perennial Streams Crossed (number)	9
Visibility Rating	430.0
Heavy Angles (number)	37

Approximately 41 percent of the alternate route is parallel to existing utility corridors, thereby minimizing impacts along nearly half of the route. One home is within 100 feet and twelve homes are within 101-200 feet of the alternate route. Two-thirds of these are already located along the existing transmission lines. Two businesses and no public facilities are located within 200 feet of the alternate route. This route crosses more cleared and agricultural land than the preferred, but less woodland. Wetland impacts are fewer than the preferred, 62.6 acres versus 66.8 acres.

5.3 IMPACTS ON NATURAL RESOURCES

Following is a description of potential impacts to natural resources in the study area from the construction and operation of the proposed project. These resources include topography, soils, hydrology, vegetation, wetlands, and wildlife.

5.3.1 Topography and Soils

Construction and operation of the proposed project would not result in any significant impacts to the existing topography. The project would generally follow the existing contour of the land. Extensive grading or earthwork would not be necessary. Land clearing would consist of tree and shrub removal. Any impacts, if any, to topography from the use of heavy equipment would be localized, minimal, and temporary in nature. The preferred and alternate routes would have similar impacts to topography.

The project would result in temporary, minor adverse soil impacts within the right-of-way during construction. Impacts to area soils would result from the use of heavy construction equipment and the excavation of soils required for burying the poles. Construction activities, which are temporary in nature, could cause soil compaction, ruts or tracks from vehicular movement, and mixing of the soil profile.

During and following construction of the proposed transmission line, some erosion could occur within the cleared right-of-way, resulting in localized increases in soil loss and perhaps some sedimentation of area streams. Mitigation proposed in Chapter 6.0 include measures that would reduce erosion and potential soil run-off into area streams.

5.3.2 Hydrology

Construction and operation of the project would not significantly impact surface water features along the transmission line route. The preferred and alternate routes would cross no major surface water features. Perennial surface water features crossed by the preferred route include Burnt Branch, Boggy Gully, Jeffries Creek, High Hill Creek, and McCall Branch. Based on USGS topographic maps, the preferred route would cross eight perennial and 47 intermittent streams. All of the streams are narrow enough that they can easily be spanned with normal spacing of the structures. Likewise, the construction and maintenance of the transmission line would not disturb any subsurface waters. Each structure would be buried to a depth of 10 percent of the actual pole height plus 2.5 feet. Therefore, a 100-foot tall structure would be buried 12.5 feet, an insufficient depth to encounter subsurface aquifers.

Perennial surface water features crossed by the alternate route include Beaverdam Creek, Burnt Branch, Buggy Gully, Jefferies Creek, Star Fork Branch, and High Hill Creek. Seven perennial and 49 intermittent streams would be crossed by the alternate route, based on USGS topographic maps. All of these streams are narrow enough that they can easily be spanned with normal spacing of the structures.

Short-term, minor water quality impacts may occur during the construction of the proposed project. Such impacts would be associated with the soils from disturbed areas being washed by stormwater into adjacent waters during rainstorm events. Increased turbidity and localized disturbance of the stream bottom may occur from the runoff. However, these impacts would not significantly alter water quality conditions and would be temporary. Additionally, mitigation measures proposed in Chapter 6.0 would minimize potential water quality impacts associated with stream crossings.

5.3.3 Vegetation

Construction and maintenance of the proposed transmission line would result in the loss of vegetation within the transmission line right-of-way due to shrub and tree clearing. Herbaceous vegetation would not be removed but could be damaged by construction equipment and vehicular movement. Damaged areas will be re-seeded following the disturbance. Most tree clearing would occur where the line crosses undeveloped forestland. The preferred route (A6+B25) would require clearing approximately 192.4 acres of forested land. The alternate route (A16+B28) would require the clearing of approximately 141.1 acres of forested land.

Less or no vegetation would need to be cleared where the transmission line shares an existing utility corridor. In addition to the clearing of the actual maintained right-of-way, danger trees that could fall into the new transmission line and cause an outage would also be removed outside the maintained corridor. Danger trees are tall trees located on or just outside the periphery of the right-of-way.

The majority of the woody vegetation that would be impacted consists of pine and deciduous hardwood stands. Trees such as pines, cypress, sycamore, black gum, oaks, hickories, ashes, and maples (Connor, 1998) occurring in or immediately adjacent to the transmission line right-of-way would have to be cleared to protect the integrity of the line. Additional temporary disturbance could occur to woody and herbaceous vegetation within the right-of-way during future maintenance of the line. Some cropland may also be impacted along the preferred route by the placement of structures. Impacts to crops are discussed in Section 5.4.1.1.

5.3.4 Threatened and Endangered Plant Species

Three federally endangered plant species are know to occur, or have occurred, within Darlington and Florence counties. Rough-leaved loosestrife (*Lysimachia asperulifolia*) is a perennial forb native to the United States. It's distribution in the United States is restricted to North and South Carolina (United States Department of Agriculture, Natural Resources Conservation Service, 2001). Rough-leaved loosestrife is typically found along the fire-maintained ecotone, or edge, between longleaf pine uplands and pond pine pocosins. Soils at these locations are typically moist to saturated sands. Rough-leaved loosestrife has also been found in bay communities on peat (U.S. Fish and Wildlife Service, Division of Endangered Species, 1992).

Canby's dropwort (*Oxypolis canbyi*) is a perennial forb native to the United States. It's distribution in the U.S. is along the Atlantic Coast, including Maryland, Delaware, North Carolina, South Carolina, and Georgia (United States Department of Agriculture, Natural Resources Conservation Service, 2001). Canby's dropwort is found in coastal plain habitats (wet meadows, wet pineland savannas, sloughs, and along the edges of Cypress-pine ponds). The most robust populations, according to the USFWS, appear to be found in open bays or ponds. Canby's dropwort favors soils with a high water table and high organic content (U.S. Fish and Wildlife Service, 1991).

American chaffseed (*Schwalbea americana*) is a perennial forb native to the United States. It's distribution in the U.S. ranges from Texas, east along the Gulf Coast, and north along the Atlantic Coast to New York and Massachusetts (United States Department of Agriculture, Natural Resources Conservation Service, 2001). American chaffseed is found on sandy, moist to dry soils in open habitats. These habitats are described as moist pine flatwoods, fire-maintained savannas, and open grass-sedge systems. Most of the surviving populations are found in areas that are still subject to frequent fires (U.S. Fish and Wildlife Service, Division of Endangered Species, 1995).

Approximately 49 percent and 58 percent of the preferred and alternate routes crosses agricultural or cleared land. These areas do not represent suitable habitat for American chaffseed, Canby's dropwort, or rough-leaved loosestrife. The remaining land crossed by the preferred and alternate routes is forested. Suitable habitat for these three species may occur within the forested areas along the preferred and alternate routes. Upon consultation with the U.S. Fish and Wildlife Service, a survey along the selected route may be required by a botanist to determine if any potential habitat or American chaffseed, Canby's dropwort, or rough-leaved loosestrife communities would be impacted by the project. Additional mitigation to avoid potential impacts is discussed in Chapter 6.0.

The only natural area in the study area, Segars-McKinnon Heritage Preserve, is located north of Hartsville. This heritage preserve is approximately 3.5 and 1.4 miles from the preferred and alternate routes, respectively. Therefore, the preferred and alternate routes would not have any significant impacts on this heritage preserve.

5.3.5 Wetlands

The coastal plains physiographic region of South Carolina contains most of the wetlands in South Carolina. Indeed, 95 percent of the forested wetlands in South Carolina are located in the coastal plain (Brown, 1997). Thus, wetland impacts were virtually unavoidable during the routing process. The right-of-way for the preferred route would cross approximately 66.8 acres of wetlands. The right-of-way for the alternate route would cross approximately 62.6 acres of wetlands. The wetlands located along the preferred and alternate routes are primarily forested wetlands associated with intermittent and perennial streams and bays.

To minimize impacts to wetland areas, the transmission line will be designed to span or avoid wetland areas where possible. Due to the availability of county highways and other roads, few new access roads would be necessary. Any possible impacts to wetlands would be temporary in nature, except in the case of the conversion of forested wetlands to emergent wetlands. This would occur when trees are removed in the right-of-way, and may require mitigation (see Chapter 6.0). CP&L will obtain the appropriate permits from the U.S. Army Corps of Engineers for any work within wetlands upon right-of-way acquisition and line design to ensure full compliance with Section 404 of the Clean Water Act and to minimize any potential impacts to wetlands located within the transmission line corridor.

5.3.6 Wildlife

Construction and maintenance of the transmission line could result in some adverse impacts to wildlife. The removal of forested vegetation within or near the proposed right-of-way may impact foraging, shelter, or nesting habitat for some species. Impacts to most species would be temporary and short-term during construction and would consist primarily of displacement and disturbance. Some less mobile species occurring in the construction corridor could be directly impacted and movements between segmented habitats could be temporarily impeded due to noise and human presence. Additional temporary disturbance could occur during future maintenance of the line. No impacts are expected to fish or invertebrate species because waterways would be spanned or avoided.

5.3.7 Threatened and Endangered Animal Species

One federally threatened and two federally endangered animal species are known to occur, or once have occurred, within Darlington and Florence counties. The bald eagle (*Haliaeetus leucocephalus*) may pass through the study area. Tall trees along rivers and streams may provide habitat for bald eagle roosting and perching. Man made water bodies also provide excellent perching habitat (Texas Parks and Wildlife, 2000). The largest water body near the preferred and alternate routes is Lake Robinson, a man made lake north of Darlington. The Darlington County Plant, where the proposed transmission line would begin, is located near the west shore of Lake Robinson. Both the preferred and alternate routes begin approximately 0.5 mile from Lake Robinson. A survey along the preferred route may be required by a qualified wildlife biologist to determine if any potential bald eagle nesting habitat may be impacted. Additional mitigation measures are described in Chapter 6.0.

Two federally endangered animal species known to occur, or that have occurred, in Darlington and Florence counties are the shortnose sturgeon (*Acipenser brevirostrum*) and the red-cockaded woodpecker (*Picoides borealis*). The shortnose sturgeon is known to occur in most major rivers along the Atlantic Coast. In South Carolina, the shortnose sturgeon is found in the river systems that flow into Winyah Bay and the Santee / Cooper River complex (National Marine Fisheries Service, National Oceanic and Atmospheric Agency, 2001). The Great Pee Dee River flows along the eastern boundary of Florence and Darlington counties. The Lynches River, which runs through Florence County and along the western boundary of Darlington County, converges with the Great Pee Dee River south of the study area. Because these two rivers are outside the study area, they will not be affected by the preferred or alternate routes. Impacts to the shortnose sturgeon would therefore not occur. Moreover, all rivers and streams would be spanned by the proposed transmission line. No structures will be placed within or on the banks of water bodies. Suitable vegetative buffers would also remain on either side of the crossing to minimize erosion.

According to the South Carolina Natural Heritage Program, several active red-cockaded woodpecker cavities were reported in Darlington County dating back to 1990. A majority of these are located in the Sandhills State Forest, located approximately 2.5 miles north of the study area. Two locations are located within the study area east of the City of Darlington. Impacts to the red-cockaded woodpecker could occur primarily from the loss of habitat. The red-cockaded woodpecker prefers open pine and pine-hardwood forest stands for nesting and foraging. Dense hardwood stands are typically avoided (U.S. Fish and Wildlife Service Division of Endangered Species, 1993). The U.S. Fish and Wildlife Service may require

the approved route be surveyed to determine the presence or absence of potential habitat. If adequate habitat is identified near the route, additional surveys and mitigation (see Chapter 6.0) may be required.

5.4 IMPACTS ON HUMAN RESOURCES

This section contains a discussion of the potential impacts of the project on the human resources in the area. The topics discussed are land use, socioeconomics, and cultural resources.

5.4.1 Existing Land Use

The following paragraphs provide information on potential impacts to agriculture, urban and residential areas, recreational areas, and transportation and utility corridors.

5.4.1.1 Agriculture

Construction and operation of the preferred route would result in some adverse impacts to agricultural land within the proposed right-of-way. Approximately 49 percent of the preferred route and 58 percent of the alternate route crosses agricultural lands. Following is a description of the agricultural impacts from the preferred and alternate routes.

The preferred route from the Darlington County Plant to the Florence Substation would cross approximately 184 acres of cleared or agricultural land. Most of the cleared land consists of croplands, pasture, and fallow fields. Some of this land also consists of forested land that had been recently cleared.

The alternate route from the Darlington County Plant to the Florence Substation would cross approximately 194 acres of cleared or agricultural land. Like the preferred route, most of this cleared land consists of cropland, pasture, and fallow fields.

The impact on pasture would be negligible since the line would not interfere with grazing. The impact to cropland was minimized during the development of routes by placing the structures where practicable along fence and property lines so the landowners could continue to farm or irrigate the fields. Temporary disturbance from heavy equipment within the right-of-way may result in the loss of some crops during construction. The only land that would be unavailable for agricultural use following construction would be the area occupied by poles or guy wires.

5.4.1.2 Urban and Residential Areas

The study area is predominately rural, with the exception of the areas surrounding Hartsville, Darlington, and Florence. The alternative routes were designed to avoid the development surrounding these areas. The following is a description of the urban and residential impacts of the preferred and alternate routes.

The preferred route would be constructed within 200 feet of seven residences and seven businesses. None of the residences are within 100 feet of the preferred route. Three of the seven residences are located on the opposite side of existing transmission lines paralleled by the preferred route. The other four residences are located where the route travels cross-country. One of these residences is located along Rancho Road, east of South Center Road; the other two are located along U.S. Highway 401. All seven businesses are located along a portion of Segment 32, east of U.S. Highway 52 and south of Palmetto Road. The distance from the preferred route to these businesses ranged from approximately 150 feet to 200 feet. Land use in this area is primarily commercial, which is typically more suitable for a transmission line than are residential areas.

5.4.1.3 Recreation Areas

Construction or operation of either the preferred or alternate route would not affect any known parks or recreation areas within the study area. One golf course is located approximately 800 feet north of the preferred route along Segment 37. High Hill Creek and the forest vegetation surrounding the creek separate the preferred route and golf course. The preferred route also parallels an existing transmission line at this location.

Both the preferred and alternate routes begin west of Lake Robinson at the Darlington County Plant. The preferred route heads west away from the lake and the alternate route heads south away from the lake. Construction and operation of either the preferred or alternate route would not impact recreation on Lake Robinson.

5.4.1.4 Transportation and Utilities

Construction of the line may result in some brief disruption of traffic during stringing of the line and hauling of material to the job site. The preferred route from the Darlington County Plant to the Florence Substation would cross approximately 47 roads. Some of the more heavily traveled roads crossed by the preferred route include Bobo Newsome Highway (S.C. 151), U.S. Highway 15 / S.C. 34, S.C. 403, Lamar Highway (U.S. Highway 401), Timmonsville Highway (S.C. 340), U.S. Highway 52, and Interstate 95. Other roads crossed include W. Old Camden Road, Wesley Chapel Road, Indian Branch Road, S. Center

Road, Potato House Road, and Ebenezer Road. CP&L would adhere to all city, county, state, and federal regulations for road crossings. The alternate route would cross 45 roads.

Construction of the preferred route would have no negative impacts to airports within the study area. Both the preferred and alternate routes were designed to be well outside the Federal Aviation Administration (FAA)-designated safe approach zones (Federal Aviation Regulations, Part 77).

The preferred and alternate routes parallel existing utilities to varying degrees. The preferred route parallels existing transmission line for approximately 9.8 miles, and crosses over existing transmission lines 15 times. The preferred route also parallels gas pipelines for approximately 6.0 miles. The alternate route parallels existing transmission line for approximately 9.9 miles (gas pipelines for approximately 3.5 miles), and crosses over existing transmission lines 13 times. Both the preferred and alternate routes would have no negative impacts to these existing utilities, though reliability may be somewhat reduced at each line crossing. Should a weather event or other accident occur that causes a pole or conductor to fall in these areas, the line crossing underneath would also be taken out of service.

5.4.2 Socioeconomic Patterns

This section addresses the potential impacts of the proposed routes on the socioeconomic patterns in the study area. The topics include population, employment, and income.

5.4.2.1 Population

Construction and operation of the preferred route would not directly result in a change in the population in the study area. The project would, however, help to meet the electrical need of the growing population (see Table 3-3) and local businesses and industries. Reliable electric service is important to residents and a significant factor in the location of many industries.

5.4.2.2 Employment and Income

Construction and operation of the line would not significantly affect employment in the study area. The construction work force would be small and temporary. Some of the workers for the project may come from the study area. Workers from outside the study area would likely commute on a daily or weekly basis. The presence of additional workers and increased employment may result in a slight increase in retail sales in the study area due to purchases of food, fuel, and other merchandise. No additional staff would be expected for operations. By meeting the need for additional power in the area, industries and businesses may be attracted to the area in the future, thereby increasing the potential for employment in

Darlington and Florence counties. The project would also increase the tax base in Darlington and Florence counties.

5.4.3 Cultural Resources

The route identification process included avoidance of known historical and archaeological resources. A records search of the study area was conducted by Burns & McDonnell at the South Carolina Institute of Archaeology and Anthropology, University of South Carolina. This search indicated that there are three recorded archaeological sites or historical structures within 1,000 feet of the preferred route. None of these sites is listed on the National Register of Historic Places (NRHP). The alternate route crosses within 1,000 feet of five archaeological sites or historical structures that are also not listed on the NRHP.

Additional cultural resources issues may arise when consultation with the State Historic Preservation Officer (SHPO) is initiated upon approval of a route by the South Carolina Public Service Commission. The SHPO may require shovel-testing along the route to document the presence or absence of artifacts since a majority of the study area has not been surveyed. The findings of the survey will be submitted to the SHPO, and any proposed mitigation would be coordinated with them. If any cultural resources were discovered during construction, CP&L would stop construction at that location and immediately notify the SHPO. Pole placement generally can be adjusted to avoid most sites potentially found along either the preferred or alternate route.

5.4.4 Visual Character

Construction and operation of the transmission line would impact the existing aesthetics of the study area through which the line passes, primarily due to the clearing of trees and the introduction of a new linear facility. Where possible, existing utility corridors were followed to minimize the visual impacts of clearing a new right-of-way. The transmission line would create a visual contrast with the surrounding environment, regardless of which route is selected. However, where present, the surrounding forest vegetation would provide visual screening.

The visibility score for the preferred route from the Darlington County Plant to the Florence Substation was higher for the portion of the route closest to the Darlington County Plant ("A" Routes). This was primarily because the preferred route does not parallel any existing transmission lines for this portion of the route. Conversely, the "B" portion of the preferred route had one of the lowest visibility ratings for the portion of the route from Segment 17 to the Florence Substation. A majority of the preferred route is

forested and it parallels multiple existing transmission lines throughout, thereby minimizing visual impacts.

The alternate route had a higher visibility rating than the preferred route, partly because it crosses more cleared and agricultural land. The alternate route, like the preferred, also parallels existing transmission lines in many places, which minimizes potential visibility impacts.

In some areas, the 100-foot tall single pole structures would elevate the transmission line above the majority of the trees so that the line could be seen from viewpoints with a long perspective. The visibility of the transmission line may could be greater at some road crossings. However, visibility from the roads would be temporary and fleeting, due to the speed of the traffic. In general, the visual character of the area has already been altered by the scores of existing transmission lines, gas pipelines, and railroads crossing the study area and the expansion of Florence, Darlington, and Hartsville. An additional transmission line would not differ significantly from the existing visual environment of the study area.

5.5 SUMMARY

The construction and operation of the proposed Darlington County Plant to Florence Substation Transmission Line Project would have only moderate impacts on natural and human resources in the study area. Following is a summary of the impacts of the preferred and alternate routes for the proposed project.

The preferred route would have relatively minor overall impacts. Only seven homes are located within 200 feet of the preferred route, and three of the seven are currently located near an existing transmission line. Approximately 49 percent, or 184.0 acres, of the preferred route crosses agricultural land. The preferred route also crosses approximately 192.4 acres of forested land and 66.8 acres of wetlands. In addition, approximately 27 and 16 percent, respectively, of the preferred route would be parallel to either existing transmission lines or gas pipelines. Although the visibility of the preferred route would be relatively high closer to the Darlington County Plant compared to other routes, the visibility would be relatively low for a majority of the preferred route through Darlington County and Florence County.

The alternate route would have slightly greater residential impacts compared to the preferred route. Seven homes are located within 200 feet of the alternate route, and one of these homes is located within 100 feet of the route. The alternate route crosses approximately 194.3 acres of cleared or agricultural land, 141.1 acres of forested land, and 62.6 acres of woodland. The alternate route also parallels existing

transmission lines and gas pipelines, but the total length parallel to existing utilities is less compared to the preferred route.

6.0 MITIGATION MEASURES

6.1 INTRODUCTION

Mitigation measures are those steps undertaken to reduce the potential impact of the construction or operation of the project on natural and human resources. The primary form of mitigation is avoidance of potential negative impacts.

This section includes a discussion of the steps taken to avoid negative impacts through the routing and design of the proposed transmission line. For those impacts that cannot be avoided, recommended measures for reducing impacts are described.

Following is a description of more specific measures to mitigate impacts.

6.2 MITIGATION OF NATURAL RESOURCE IMPACTS

Approximately 37 miles of new transmission line circuit would be built between the Darlington County Plant and Florence Substation. The primary issues discussed in Chapter 5.0 related to natural resources were soil and erosion control, water resources and wetlands and threatened and endangered species. Measures to avoid or eliminate potential negative impacts to these resources are described below.

6.2.1 Soil and Erosion Control

All clearing, construction, and maintenance will be in accordance with Best Management Practices (BMP) published by the South Carolina Forestry Commission. Stumps would be left in place to prevent soil erosion. Precautions would be undertaken to avoid disturbing ground cover along the right-of-way, particularly at stream crossings.

Holes for each pole will be dug with an auger and the structures will be erected using a crane. The poles will be buried directly in the ground. Excess soil from the pole excavations will be evenly distributed around each pole and the soil stabilized. When heavy equipment must traverse the right-of-way, access routes will be selected to minimize impacts by avoiding streams, wetlands, and excessive cuts or fills as much as practicable, and by following existing ground contours. Soil disturbed by construction activities will be restored to its original contours and appropriate ground cover will be established to prevent erosion of the soil. The contractor will implement erosion control measures as recommended in the Best

Management Practices from the South Carolina Forestry Commission. Where specified, portions of the right-of-way will be seeded to prevent erosion.

Where possible, contractors would use existing access roads along the rights-of-way that will be paralleled. If new access roads are required, they will be routed, where practicable, to follow present land contours and minimize clearing and surface changes.

6.2.2 Protection of Water Resources and Wetlands

All waterways will be maintained for proper drainage through the use of culverts or other crossing devices, according to CP&L's standard policies. Buffer zones of vegetation will be left undisturbed at stream crossings. If trees need to be removed, they will be cut so that the root system is not disturbed to help maintain bank stabilization. CP&L will use sediment barriers along all waterways and steep slopes during construction to protect waterways from soil erosion and sedimentation. New access roads for vehicles and equipment will be selected to avoid damage to stream banks and wetlands.

All vegetation will be cut above ground level, and there will be no grubbing of stumps, root raking, or other soil disturbance. Access to the right-of-way will be by progressively less impacting methods (standard trucks, low impact tracked vehicles, mats, and/or hand cutting where needed), as required to avoid impacts to wetlands. If numerous poles must be placed in a wetland, a helicopter may be used to install the poles. The method used to install the structure will depend on the nature of the sub-surface conditions. If the sub-surface conditions are appropriate, the poles will be installed by directly burying the pole in the soil. Any spoil material will be removed from the site. If poor sub-surface soil conditions are expected based on investigations of the soil, then steel caissons will be used. These steel caissons are vibrated into the soil and the pole is placed on top of the caisson.

Should any clearing involve wetlands, CP&L will use the least intrusive method reasonably possible to clear the corridor. In jurisdictional wetlands that are "dry" enough to access without rutting, standard equipment will be used for vegetation cutting. Where the ground will not support the equipment directly, either mats or high-flotation equipment will be used to access an area. When neither of these methods can be used to access an area without disturbing the soil, the corridor will be hand cut to avoid disturbing the wetlands. Trees outside of the right-of-way corridor tall enough to endanger the line if they fell ("danger trees") will also be selectively cut.

There will be no change in contours or redirection of water flow, and the amount of spoilage from burying the structures will be minimal. Excess spoilage will be removed from the site. If a section of the line cannot be accessed from existing roads, there may be some additional discharge of dredged or fill material into the wetlands due to access road construction. If a road must be built within a forested wetland, CP&L will follow the Best Management Practices published by the South Carolina Forestry Commission. In the case where a section of the transmission line cannot be accessed by existing roads, CP&L may need to install a culvert, ford, or temporary bridge to cross small creeks and streams. Additional mitigation measures may also be implemented regarding wetlands following consultation with the U.S. Army Corps of Engineers for Section 404 wetland permits.

6.2.3 Threatened and Endangered Species

Correspondence has been initiated with the U.S. Fish and Wildlife Service (USFWS) regarding potential impacts, if any, concerning state or federally protected species. Further consultation with the USFWS will be initiated once a route has been approved. Three endangered plant species, rough-leaved loosestrife, American chaffseed, and Canby's dropwort, are found in Darlington, Florence, and Lee counties. Recommendations from the USFWS may include surveys along the approved route by a qualified botanist to determine if any habitat or communities of these, or any other, protected plant species may be impacted. Mitigation to avoid damage to protected plant communities or habitat could include strategic pole placement, avoidance, or any other USFWS recommendations.

The USFWS may also recommend a survey of the selected route by a wildlife biologist for the presence of protected wildlife species. In the case of the bald eagle, the USFWS may require a survey be conducted within suitable habitat. A wildlife biologist would visit the site to determine if any potential nesting trees are present and likely to be cleared. If such trees are found, additional mitigation measures to avoid impacting the bald eagle may be recommended by the USFWS.

The USFWS may also request a habitat survey for the red-cockaded woodpecker along the approved route. The survey would likely involve a search for suitable red-cockaded woodpecker habitat (i.e., open pine woodlands) within a specified distance from the route recommended by the USFWS. If suitable red-cockaded woodpecker habitat is identified within the vicinity of the approved route, a survey may be required to determine if any red-cockaded woodpeckers are present and to locate any active nests. If any red-cockaded woodpeckers are present, mitigation will be required, which may include adjusting the approved route to avoid clearing trees that are potential foraging or nesting habitat, or any other additional mitigation recommended by the USFWS.

The USFWS may also require a payment of a fee to a mitigation bank for impacts to these or any other protected species based upon the amount of habitat impacted. They could also require the purchase of mitigation lands at an appropriate ratio to offset the impacts of the approved route. Any recommendations made by the USFWS will be followed to minimize or avoid impacts to protected species. Recommendations from the South Carolina Wildlife and Freshwater Fisheries Division will be followed as necessary to avoid impacts to state protected species.

6.3 MITIGATION OF HUMAN RESOURCE IMPACTS

The main issues discussed in Chapter 5.0 related to human resources were land use, cultural resources, and visual character. Measures to avoid or eliminate potential negative impacts to these resources are described below.

6.3.1 Land Use

Routes were initially identified that minimized impacts to residences to the extent possible. The preferred route minimizes the residential impact by passing no closer than approximately 101 to 200 feet to any home. In addition, existing utility rights-of-way were followed to the extent possible to minimize the amount of new right-of-way required, thereby limiting impacts to property owners. Utilizing existing utility rights-of-way also minimizes impacts to agricultural land, forestland and wetlands by reducing the amount of new right-of-way required.

6.3.2 Cultural Resources

The route identification process included avoidance of known historical and archaeological resources. Formal consultation with the State Historical Preservation Officer (SHPO) will begin prior to construction. Because little of the study area has been previously surveyed, the SHPO may recommend that CP&L perform an archaeological survey of the proposed route, especially if the route crosses areas that have the potential to contain archaeological resources possibly eligible for inclusion in the National Register of Historic Places (NRHP). If the survey results in the discovery of any sites that are considered eligible for the NRHP, the line or poles would be adjusted to avoid the site, or other actions would be taken as recommended by the SHPO. The findings of the survey would be submitted to the SHPO, and any proposed mitigation would be coordinated with them. If any cultural resources are discovered during construction, CP&L would stop construction at that location and immediately notify the SHPO.

6.3.3 Visual Character

The single pole structures proposed for this project are generally considered to be more attractive to the public than the H-frame and lattice tower structures used elsewhere. In addition, they will be constructed of weathered steel poles. See Appendix D for photographs of similar structures. Because angle structures are larger, require more space, and hence are more visible, the preferred route was designed to minimize the number of such structures to the extent practicable, while also avoiding residences and other known constraints. Structures will also be placed to take advantage of any existing vegetation for screening from residences and roadways.

Following an existing transmission line for approximately 27 percent of the preferred route would reduce visual impacts. Spans between the structures of the new line may vary from those of the existing transmission lines due to structural and voltage differences. Therefore, the new poles will not always be adjacent to the existing structures. Following a gas pipeline for approximately 16 percent also minimizes the amount of new right-of-way required. Although the new transmission line structures may be visible along the corridor, a narrower right-of-way is less intrusive. Minimizing the amount of agricultural or cleared land crossed would also contribute to limiting visual impacts since remaining trees may screen the transmission line and right-of-way.

6.4 CONCLUSION

By following the company's standard construction practices, the route selection process described, and the above mitigation techniques, most potential impacts of the selected route will be either avoided or minimized. As a result, the construction and operation of the proposed project will have minimal effects on the natural resources and human resources within the study area.

7.0 Summary

7.0 SUMMARY

CP&L is proposing to construct approximately 37 miles of new 230-kV transmission line in Darlington and Florence counties, South Carolina. The preferred route leaves the Darlington County Plant heading east for approximately 1.9 miles before turning south for approximately 3.5 miles. At this point, the preferred route turns southeast for approximately 9.1 miles, crosses through Lee County for a short distance, and crosses U.S. Highway 15 / S.C 34 and S.C. 403. The preferred route then heads east-southeast for approximately 13.8 miles, crossing several smaller roads as well as U.S. Highway 401 (Lamar Highway) and S.C. 340 (Timmonsville Highway). The preferred route then turns northeast for 1.6 miles, crossing U.S. Highway 52, before turning southeast for approximately 1.7 miles and crossing into Florence County. The preferred route follows south of the Darlington County boundary with Florence County for approximately 3.0 miles. After turning south and parallel to an existing transmission line, the preferred route travels approximately 1.8 miles and enters the Florence Substation.

The preferred route was selected because it would have the least overall environmental impacts. The preferred route parallels both existing transmission lines and gas pipelines, which reduces the required right-of-way and minimizes impacts to agricultural land, woodland and wetlands. The preferred route would also have minimal residential impacts compared to most other routes. An alternate route was selected in addition to the preferred route to be used in the event the preferred route could not be constructed. The alternate route was selected because it also has minimal impacts to the social and environmental resources in the study area and because it provides an alternate path from the Darlington County Plant to the Florence Substation from the preferred route.

In accordance with Chapter 33, Title 58 of the South Carolina Code of Laws 1976, CP&L filed an application with the Public Service Commission of South Carolina on December 3, 2002 to obtain a Certificate of Environmental Compatibility and Public Convenience and Necessity.

8.0 References

8.0 REFERENCES

Barnes, B.W. 1991. Deciduous Forests of North America. In: Temperate Deciduous Forests (Röhrig, E. and B. Ulrich, eds.) Elsevier, Amersterdam, Netherlands. pp. 219-344.

Brown, M.J. 1997. Distribution and characterization of forested wetlands in the Carolinas and Virginia. Southern Journal of Applied Forestry, 21(2): 64-70.

Cherry, R.N. and A.W. Badr. 1998. South Carolina Water Plan. South Carolina Department of Natural Resources, Land, Water, and Conservation Division. Columbia, South Carolina. [cited 03 April 2002]. Available http://www.dnr.state.sc.us/water/hydro/waterplan.html.

Clemson University Extension Agriculture and Applied Economics. 2001. Darlington County Agricultural Summary Statistics. <http://cherokee.agecon.clemson.edu/darlingt.htm> April 2002.

Clemson University Extension Agriculture and Applied Economics. 2001. Florence County Agricultural Summary Statistics. <http://cherokee.agecon.clemson.edu/florence.htm> April 2002.

Colburn, W.L. 1960. Soil Survey of Darlington County, South Carolina. U.S. Department of Agriculture, Soil Conservation Service (currently the Natural Resource Conservation Service).

Connor, R.C. 1993. Forest Statistics for South Carolina, 1993. In United States Department of Agriculture Forest Service, Southeastern Forest Experiment Station, Resource Bulletin SE-141, Asheville, North Carolina. [cited 18 April 2002]. Available http://www.srs.fs.fed.us/pubs/viewpub.jsp?index=218.

Connor, R.C. 1998. South Carolina's Forests, 1993. In United States Department of Agriculture Forest Service, Southern Research Station Bulletin SRS-25, Asheville, North Carolina. [cited 30 April 2002]. Available http://www.srs.fs.fed.us/pubs/viewpub.jsp?index=319.

Cowardin, L.M., V. Carter, F.C. Golet, and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Department of Interior, Fish and Wildlife Service. U.S. Government Printing Office, Washington, D.C.

DeLorme. 1998. South Carolina Atlas and Gazetteer. 1st ed. Yarmouth, Maine.

DeLorme. 2000. Street Atlas USA version 8.0. Yarmouth, Maine.

DeskMap Systems, Inc. 1998. Professional Railroad Atlas of North America. 1st ed. Austin, Texas.

Florence Municipal / County Planning Department. 1997. Elements of the Florence County Comprehensive Plan. Florence, South Carolina.

Harper, R. 2001. Cash Receipts from Timber Harvests by County-1999. Clemson University Extension Forestry Resources. <http://www.clemson.edu/extfor/forest_data/1999cashreceipts.htm> April 2002.

Morton, R. 2000. Soil Survey of Darlington County, South Carolina. U.S. Department of Agriculture, Natural Resources Conservation Service.

National Marine Fisheries Service, National Oceanic and Atmospheric Administration. 2001. Shortnose Sturgeon Fact Sheet. <http://www.nmfs.noaa.gov/prot_res/species/fish/Shortnose_sturgeon.html> July 2002.

National Register of Historic Places.com. 2002. National Register of Historic Places - South Carolina, Darlington County Historic Districts. <http://www.nationalregisterofhistoricplaces.com/SC/Darlington/districts.html> August 2002.

Nelson, J.B. 1986. The Natural Communities of South Carolina. South Carolina Wildlife and Marine Resources Department. Columbia, South Carolina.

Pitts, J.J. 1974. Soil Survey of Florence and Sumter Counties, South Carolina. U.S. Department of Agriculture, Soil Conservation Service (currently the Natural Resources Conservation Service).

Preston, R.J. Jr. 1989. North American Trees. 4th ed. Iowa State University Press. Ames, IA.

South Carolina Budget and Control Board, Office of Research and Statistics. 2000. Online South Carolina Population Data, South Carolina Population Projections 2005-2010. <http://167.7.127.238/Population2/default.html> April 2002.

South Carolina Budget and Control Board, Office of Research and Statistics. 2001. 2000-2001 South Carolina Statistical Abstract. Chapter 1, Places in South Carolina. <http://www.ors.state.sc.us/abstract_99/chap1/cities.htm> May 2002.

South Carolina Budget and Control Board, Office of Research and Statistics. 2000. 2000-2001 South Carolina Statistical Abstract. Chapter 14, South Carolina Urban and Rural Population: 1790-1990. <http://www.ors.state.sc.us/abtract_99/chap14/pop23.html> May 2002.

South Carolina Budget and Control Board, Office of Research and Statistics. 2001. 2000-2001 South Carolina Statistical Abstract. Chapter 14, Components of Population Change for South Carolina Counties (1990-2000). <http://www.ors.state.sc.us/abstract_99/chap14/pop21.htm> July 2002.

South Carolina Department of Health and Environmental Control, Bureau of Water. 2001. Groundwater Fact Sheet. Columbia, South Carolina. [cited 24 April 2002]. Available http://www.scdhec.net/eqc/admin/html/eqcpubs.html#Water.

South Carolina Department of Health and Environmental Control, Bureau of Water. 2001. Watershed Water Quality Assessment: Pee Dee Basin. Columbia, South Carolina. [cited 22 April 2002]. Available http://www.scdhec.net/eqc/admin/html/eqcpubs.html#Water.

South Carolina Department of Health and Environmental Control. Undated. A Brief Guide to Wetland Regulations in South Carolina. Columbia, South Carolina. [cited 22 April 2002]. Available http://www.scdhec.net/water/html/401.html.

South Carolina Department of Health and Environmental Control, Bureau of Water. 2002. Wetlands: Essential for Wildlife Habitat, Improving Water Quality and Providing Flood Protection. Columbia, South Carolina. [cited 22 April 2002]. Available http://www.scdhec.net/water/html/401.html.

South Carolina Department of Health and Environmental Control, Bureau of Water, Watershed Management. 2002. Pee Dee River Basin. <http://www.scdhec.net/water/shed/peedee.html> July 2002.

South Carolina Department of Natural Resources. 2001. SCDNR South Carolina Rules and Regulations: Wildlife Management Areas in South Carolina. Columbia, South Carolina. [cited 08 July 2002]. Available http://www.dnr.state.sc.us/etc/rulesregs/rulesregs.html.

South Carolina Department of Natural Resources, Wildlife and Freshwater Fisheries Division. 2002. South Carolina Rare, Threatened & Endangered Species Inventory - Species Found in Florence County. <http://www.dnr.state.sc.us/pls/heritage/county_species.list?pcounty=florence> August 2002.

South Carolina Department of Transportation. 2002. I-95 Widening. <http://www.dot.state.sc.us/I-95/default.html> June 2002.

South Carolina Division of Aeronautics. 2001. South Carolina Aviation Facilities. <http://www.scaeronautics.com/AirportSearch.asp> March 2002.

South Carolina Employment Security Commission. 2002. Labor Force and Employment, January 1996-December 2001. <http://www.sces.org/lmi/data/labor-force/lf.asp> August 2002.

South Carolina Heritage Trust. 2002. South Carolina Rare, Threatened & Endangered Species Inventory, Geographic Database of Rare and Endangered Species. <http://www.dnr.state.sc.us/pls/heritage/species.auth> August 2002.

Texas Parks and Wildlife. 2000. Bald Eagle Fact Sheet. <http://www.tpwd.state.tx.us/nature/endang/birds/baldeagl.htm> July 2002.

University of Georgia, Savannah River Ecology Laboratory. 2001. Carolina Bays Fact Sheet. <http://www.uga.edu/~srel/bays.htm> April 2002.

U.S. Census Bureau. 2001. 1997 Economic Census. <http://www.census.gov/epcd/ec97/sc/SC000.HTM> July 2002.

U.S. Census Bureau. 2002. <http://factfinder.census.gov/servlet/BasicFactsServlet> July 2002.

U.S. Department of Agriculture-National Agricultural Statistics Service. Undated. 1997 Census of Agriculture, South Carolina County and State Profiles. <http://www.nass.usda.gov/census/census97/profiles/sc/sc.htm> April 2002.

U.S. Department of Agriculture, Natural Resources Conservation Service. 2001. The PLANTS Database, Version 3.1 (http://plants.usda.gov). National Plant Data Center, Baton Rouge, Louisiana 70874-4490 USA.

U.S. Department of Agriculture, Natural Resources Conservation Service, Soil Survey Division. 2002. List of Published Soil Surveys, South Carolina. <http://www.statlab.iastate.edu/soils/soildiv/> August 2002.

U.S. Fish and Wildlife Service, Carolina Sandhills National Wildlife Refuge. 2001. Flora and Fauna at Carolina Sandhills Wildlife Refuge. [cited 8 July 2002]. Available http://carolinasandhills.fws.gov/florafauna.html.

U.S. Fish and Wildlife Service, Carolina Sandhills National Wildlife Refuge. 2001. 2001 Bird Checklist for Carolina Sandhills NWR. [cited 8 July 2002]. Available http://carolinasandhills.fws.gov/publications.html.

U.S. Fish and Wildlife Service, Division of Endangered Species. 1993. Species accounts: Red-cockaded woodpecker. In Endangered and Threatened Species of the Southeastern United States (The Red Book). FWS Region 4. [cited 31 July 2002]. Available http://endangered.fws.gov/i/b/sab4a.html.

U.S. Fish and Wildlife Service, Division of Endangered Species. 1992. Species accounts: Rough-leaved loosestrife. In Endangered and Threatened Species of the Southeastern United States (The Red Book). FWS Region 4. [cited 22 July 2002]. Available http://endangered.fws.gov/i/q/saq4b.html.

U.S. Fish and Wildlife Service, Division of Endangered Species. 1991. Species accounts: Canby's dropwort. In Endangered and Threatened Species of the Southeastern United States (The Red Book). FWS Region 4. [cited 22 July 2002]. Available http://endangered.fws.gov/i/q/saq4b.html.

U.S. Fish and Wildlife Service, Division of Endangered Species. 1995. Species accounts: American chaffseed. In Endangered and Threatened Species of the Southeastern United States (The Red Book). FWS Region 4. [cited 22 July 2002]. Available http://endangered.fws.gov/i/q/saq4b.html.

U.S. Fish and Wildlife Service, Southeastern Region Ecological Services. 1999. County Lists of Endangered, Threatened, Proposed, and Candidate Species for the Southeast Region. <http://es.southeast.fws.gov/county%20lists.htm> April 2002.

Appendices

Appendix A
Agency Correspondence

APPENDIX A
AGENCY CORRESPONDENCE

- Sample letter sent to agencies
- Correspondence from the U.S. Fish and Wildlife Service
- Correspondence from the South Carolina State Historic Preservation Office

Burns & McDonnell
SINCE 1898

April 2, 2002

Sample of Letter Sent to Agencies

Mr. Les Parker
U.S. Army Corps of Engineers
Charleston District
Strom Thurmond Federal Building
Room 865 B-1
Columbia, SC 29201

Carolina Power & Light - Darlington to Florence Transmission Line Project
Request for Information
Project no. 29330

Dear Mr. Parker:

Burns & McDonnell Engineering Co., Inc. has been retained by Carolina Power & Light (CP&L) to conduct a routing study and environmental review for a 230-kV overhead electric transmission line to be located in Darlington, Florence, and northeastern Lee counties in South Carolina. The transmission line will provide an approximate 32-mile connection between CP&L's Darlington County Plant and their existing Florence 230-kV Substation. Enclosed are reduced U.S.G.S. 7.5-minute topographic maps illustrating the study area. We would like to receive information on potential areas or issues of concern within the study area that may impact the identification and selection of a route for the transmission line.

The Darlington County Plant is located at the southwest corner of Lake Robinson east of South Carolina State Route 151. This is approximately 3.6 miles northwest of Hartsville, South Carolina. The Florence 230-kV Substation is located within Florence city limits. The exact alignment of the transmission line is not known at this time. Alternative routes will be identified within the study area primarily in Darlington and Florence counties that minimize environmental and social impacts. Some of the alternatives will follow existing transmission line and pipeline rights-of-way within the study area.

The construction of the line would consist of weathered steel, single-pole structures, or H-frame structures, with a typical height of approximately 85-105 feet tall. The typical span between structures would be 500-700 feet. The width of right-of-way required would be approximately 100 feet where no other transmission line is followed. The location of the structures is somewhat flexible in that sensitive resources, if present, could be avoided. All streams and rivers would be spanned.

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

Please provide us with information on any wetlands or Corps property that could be impacted by the project. Input from your agency regarding natural resources within the study area will assist us in the route selection and environmental documentation necessary for the project.

We appreciate your assistance. Please contact me at (816) 822-3598, or by email at kwise@burnsmcd.com, should you have any questions or require additional information.

Sincerely,

Kristi Wise
Project Manager

Enclosure

cc: Files

9400 Ward Parkway
Kansas City, Missouri 64114-3319
Tel: 816 333-9400
Fax: 816 333-3690
www.burnsmcd.com

United States Department of the Interior

FISH AND WILDLIFE SERVICE
176 Croghan Spur Road, Suite 200
Charleston, South Carolina 29407

May 2, 2002

Ms. Kristi Wise
Burns & McDonnell
9400 Ward Parkway
Kansas City, Missouri 64114-3319

Re: Carolina Power & Light- Darlington to Florence Transmission Line Project
Project No. 29330
FWS No. 4-6-02-I-209

Dear Ms. Wise:

We have reviewed the information received April 18, 2002 concerning the above-referenced project. The following comments are provided in accordance with the Fish and Wildlife Coordination Act, as amended (16 U.S.C. 661-667e), and section 7 of the Endangered Species Act, as amended (16 U.S.C. 1531-1543).

We are providing a list of the federally endangered (E) and threatened (T) and candidate (C) species which potentially occur in Darlington and Florence Counties, South Carolina to aid you in determining the impacts your project may have on protected species. The list also includes species of concern under review by the Service. Species of concern (SC) are not legally protected under the Endangered Species Act, and are not subject to any of its provisions, including Section 7, until they are formally proposed or listed as endangered/threatened. We are including these species in our response for the purpose of giving you advance notification. These species may be listed in the future, at which time they will be protected under the Endangered Species Act. Therefore, it would be prudent for you to consider these species early in project planning to avoid any adverse effects.

County	Common Name	Scientific Name	Status	Occurrences
Darlington				
	Red-cockaded woodpecker	*Picoides borealis*	E	Known
	Rough-leaved loosestrife	*Lysimachia asperulaefolia*	E	Known

	Awned meadowbeauty	*Rhexia aristosa*	SC	Known
	Carolina bogmint	*Macbridea caroliniana*	SC	Known
	Georgia lead-plant	*Amorpha georgiana var. georgiana*	SC	Known
	Rafinesque's big-eared bat	*Corynorhinus rafinesquii*	SC	Known
	Sandhills milkvetch	*Astragalus michauxii*	SC	Known
	Spring-flowering goldenrod	*Solidago verna*	SC	Known
	Well's pixie-moss	*Pyxidanthera brevifolia*	SC	Known
	White false-asphodel	*Tofieldia glabra*	SC	Known
	Madtom, broadtail	Noturus sp 2	SC	Possible
Florence				
	Bald eagle	*Haliaeetus leucocephalus*	T	Known
	Red-cockaded woodpecker	*Picoides borealis*	E	Known
	Canby's dropwort	*Oxypolis canbyi*	E	Known
	Chaffseed	*Schwalbea americana*	E	Known
	Carolina bogmint	*Macbridea caroliniana*	SC	Known
	Georgia lead-plant	*Amorpha georgiana var. georgiana*	SC	Known
	Ovate catchfly	*Silene ovata*	SC	Known
	Madtom, broadtail	Noturus sp 2	SC	Possible

In-house surveys should be conducted by comparing the habitat requirements for the attached listed species with available habitat types at the project site. Field surveys for the species should be performed if habitat requirements overlap with that available at the project site. Surveys for protected plant species must be conducted by a qualified biologist during the flowering or fruiting period(s) of the species. Please notify this office with the results of any surveys for the above list of species.

We also recommend you contact the S.C. Department of Natural Resources (SCDNR), Data Manager, Wildlife Diversity Section, Columbia, SC 29202, concerning known populations of federal and/or state endangered or threatened species, and other sensitive species in the project area. Additional habitat information may also be available from SCDNR. The National Marine Fisheries Service, 9721 Executive Center Drive North, St. Petersburg, FL 33702-2449 should be contacted for consultation on species under their jurisdiction.

In accordance with the provisions of the Fish and Wildlife Coordination Act, the Service also has reviewed the subject project with regard to the effects the proposed action may have on wetlands and related fish and wildlife resources. Review of aerial photography revealed the presence of wetlands on the site. We recommend that project plans be developed to avoid impacting wetland areas and reserve the right to review any required federal or state permits at the time of public notice issuance. The U.S. Army Corps of Engineers should be contacted to assist you in determining if wetlands are present or if a permit is required for this activity.

Your interest in ensuring the protection of endangered and threatened species and our nation's valuable wetland resources is appreciated. If you have further questions or require additional information, please contact Ms. Sandy Abbott of this office at (843) 727-4707 ext. 57. In future correspondence concerning the project, please reference FWS Log No 4-6-02-I-209.

Sincerely yours,

Roger L. Banks
Field Supervisor

RLB/SDA/km

From: "Brock, Nancy" <Brock@SCDAH.STATE.SC.US>
To: "'kwise@burnsmcd.com'" <kwise@burnsmcd.com>
Date: 4/9/02 2:48PM
Subject: Darlington to Florence Transmission Line Project No. 29330

Darlington to Florence Transmission Line Project
Request for Information
Project No. 29330

Dear Ms. Wise:

I'm responding to your letter of April 2 to our office regarding your request for information.

We can review a federally funded, licensed or approved project. We don't have enough staff to provide answers to individual requests for research information. We have set up our GIS database in our Reference Room; the GIS database contains information on National Register listed properties, properties determined eligible by the SHPO, and properties identified through county or other cultural resources surveys. You must arrange to access this information through our Reference Room.

I can be reached directly at 803/896-6169 if you have additional questions.

Nancy Brock
Coordinator, Review and Compliance Programs
SC State Historic Preservation Office

Appendix B
Public Involvement Information

APPENDIX B
PUBLIC INVOLVEMENT INFORMATION

- Progress Energy press releases
- Progress Energy press release from CP&L web site
- Letter to area residents announcing public workshop
- Project information sheet from public workshop
- Project site map from public workshop
- Public workshop questionnaire
- Project information from CP&L web site
- Project questionnaire from CP&L web site
- Project site map from CP&L web site
- Public workshop questionnaire results
- Selected route map from CP&L web site

CP&L
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news release

CP&L holding public information meetings on transmission project

FLORENCE, S.C. (May 16, 2002) – As announced recently, CP&L will hold two public information meetings in the area next week to give area residents an opportunity to learn more about the company's plan to invest about $19.5 million in upgrading electric transmission facilities in Darlington, Florence and Lee counties over the next three years.

CP&L plans to build a 32-mile, 230-kiloVolt electric transmission line to better serve customers in the area. The line will run from CP&L's Darlington County Plant, near Hartsville, to an existing 230-kiloVolt electric substation in Florence. The project is one of several major transmission upgrades under way throughout CP&L's service area. The company expects to invest about $200 million in transmission system enhancements over the next several years, as part of CP&L's commitment to ensuring a continuous reliable flow of electricity to its customers.

The public information meetings are scheduled for Tuesday, May 21, at the American Legion Post 13 building, 1752 Harry Byrd Highway (next to the National Guard Armory) in Darlington; and Thursday, May 23, at Williams Middle School, 1119 N. Irby St. in Florence.

Both meetings will be from 5 p.m. to 7:30 p.m. and will follow an open-house format, allowing residents to come and go as they please. CP&L representatives will provide information on the need, route alternatives, schedule and other aspects of the project. The company also is seeking input from area residents about prospective routing options for the power line. Property owners located within 200 feet of an identified route alternative are being notified of the project and public information meetings by mail.

"We're really looking for two-way communication at these meetings," said Emerson Gower, vice president of CP&L's Southern Region, headquartered in Florence. "We're making a significant investment in ensuring the long-term reliability of the electric system that serves our customers. But we recognize that our neighbors in the study area know things about the region that we might not, and the information they can provide us is extremely valuable as we work to site new facilities."

The project calls for the new transmission line to be operational by June 2005. Power line route selection, right-of-way acquisition, additional engineering and design and other milestones will occur before construction begins. The construction process is expected to begin in early 2004 and take about 16 months.

###

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Corporate Communications
P.O. Box 1551
Raleigh, NC 27602

Progress Energy 24-Hour Media Line:
Toll Free 877.641.NEWS(6397) or 919.546.6189
Fax 919.546.6615
www.progress-energy.com

CP&L
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news release

CP&L investing $19.5 million in transmission system upgrade

FLORENCE, S.C. (May 8, 2002) – CP&L has announced that as part of its plan to ensure a continued reliable flow of electricity in the Pee Dee Region, the company will invest about $19.5 million in upgrading electric transmission facilities in Darlington, Florence and Lee counties over the next three years.

CP&L plans to build a 32-mile, 230-kiloVolt electric transmission line to better serve customers in the area. The line will run from CP&L's Darlington County Plant, near Hartsville, to an existing 230-kiloVolt electric substation in Florence.

The project is one of several major transmission upgrades under way throughout CP&L's service area. The company expects to spend about $200 million on transmission system enhancements over the next several years.

"Electricity usage in this area continues to grow at a significant rate, and the electric system must keep pace," said Emerson Gower, vice president of CP&L's Southern Region, which includes the Pee Dee Region. "In addition to building a number of new power plants to serve our customers, CP&L must continue to enhance the transmission and distribution systems to ensure a continuous supply of electricity to homes and businesses in the region.

"Our studies show that the transmission system upgrades will enable us to continue meeting the needs of our customers in Florence and Darlington counties and the surrounding area well into the future, without potentially creating the types of electric system concerns that have plagued other parts of the country in recent months."

Public information meetings scheduled

CP&L will hold two public information meetings for area residents to learn more about the project. The meetings are scheduled for Tuesday, May 21, at the American Legion Post 13 building, 1752 Harry Byrd Highway (next to the National Guard Armory) in Darlington; and Thursday, May 23, at Williams Middle School, 1119 N. Irby St. in Florence.

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More about the project

The new power line will be attached to transmission poles, spaced approximately every 500 to 700 feet and standing 85 to 100 feet tall. It will begin at a substation located at the Darlington County Plant (4030 W. Bobo Newsom Highway). The line will terminate at a substation at 1200 N. Douglas St. in Florence. Substations are facilities that reduce the voltage of electricity to a level that can be distributed to homes and businesses.

The project calls for the new transmission line to be operational by June 2005. Power line route selection, right-of-way acquisition, additional engineering and design and other milestones will occur before construction begins. The construction process is expected to begin in early 2004 and take about 16 months.

The process of route selection is under way, and the information gathered at the public information meetings will aid that process. A final route will be chosen this summer. Acquisition of the transmission line right of way (about 50 feet on either side of the line) is scheduled to begin in late 2002. CP&L purchases easements from property owners to allow for construction and maintenance of the power line. The property owners retain ownership of the land.

CP&L will work with local governments and agencies to ensure that the project complements local growth plans. The company will comply with all regulatory requirements related to the construction and operation of the facilities. CP&L's paramount objective is to ensure the health and safety of our customers and employees during construction and operation.

CP&L, a subsidiary of Progress Energy (NYSE: PGN), provides electricity and related services to more than 1.2 million customers in South Carolina and North Carolina. The company is headquartered in Raleigh and serves a territory encompassing more than 33,000 miles. For more information about CP&L, visit the company's Web site at: http://www.cpl.com.

###

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Progress Energy

CP&L investing $19.5 million in transmission system upgrade
05-08-2002

FLORENCE, S.C. (May 8, 2002) -- CP&L has announced that as part of its plan to ensure a continued reliable flow of electricity in the Pee Dee Region, the company will invest about $19.5 million in upgrading electric transmission facilities in Darlington, Florence and Lee counties over the next three years.

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The project is one of several major transmission upgrades under way throughout CP&L's service area. The company expects to spend about $200 million on transmission system enhancements over the next several years.

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CP&L will work with local governments and agencies to ensure that the project complements local growth plans. The company will comply with all regulatory requirements related to the construction and operation of the facilities. CP&L's paramount objective is to ensure the health and safety of our customers and employees during construction and operation.

CP&L, a subsidiary of Progress Energy (NYSE: PGN), provides electricity and related services to more than 1.2 million customers in South Carolina and North Carolina. The company is headquartered in Raleigh and serves a territory encompassing more than 33,000 miles. For more information about CP&L, visit the company's Web site at: http://www.cpl.com.

# # #

Contact our 24-hour media line: 1-877-641-NEWS or 1-919-546-6189

[Date]

[Mr., Mrs., etc.] [First Name] [Last Name]
[Address]
[City, State, Zip Code]

CP&L's Darlington County Plant – Florence 230Kv Transmission Line Project
Notification of Public Information Workshops

Dear [Mr., Mrs., etc.] [Last Name]:

CP&L is planning a new overhead electric transmission system project for Florence, Darlington, and part of Lee counties. The $19.5 million construction investment is needed to keep pace with the rapid growth in population and electricity demand in the region.

CP&L's continuous assessment of electric system requirements has identified the need for a new overhead electric transmission line between the Florence area and the Darlington County Plant near Hartsville to ensure a continued reliable supply of electric service to homes and businesses.

This new transmission line is scheduled to be in operation by June 2005. This project is one of several transmission system upgrades CP&L has announced in South Carolina and North Carolina to ensure that each state's area residents and businesses do not experience the kinds of electric system problems that have plagued other parts of the country.

Included with this letter, you will see a general map of the transmission line project study area within which CP&L will locate the new overhead 230-kilovolt transmission line. To give area residents an opportunity to learn more about this project, CP&L will conduct two public information workshops. **The first workshop will be held on Tuesday, May 21, from 5 p.m. to 7:30 p.m. at the American Legion Post 13 Building located at 1752 Harry Byrd Highway in Darlington. The second workshop will be held on Thursday, May 23, from 5 p.m. to 7:30 p.m. at Williams Middle School in the cafeteria. Williams Middle School is located at 1119 North Irby Street in Florence.** CP&L representatives will be present to answer questions and provide information on the need, schedule, and other aspects of the project. CP&L will also be soliciting input from area residents about prospective routing options for the new transmission line. The meeting will follow an open-house format, allowing area residents to come and go as they please.

CP&L will also have information about this project on its Corporate Website, www.cpl.com.

If you have questions about this project, I encourage you to join us at the public workshops May 21 and 23. CP&L is committed to working with the people of Florence, Darlington, and Lee counties to incorporate local knowledge and concerns into planning and siting this new transmission line as we complete the electric system enhancements necessary to support the future of our region.

Sincerely,

Eddie L. Taylor

Eddie L. Taylor
Lead Engineer
CP&LTransmission Department

Attachment

Let's Talk | Information Meeting for the Darlington - Florence Transmission Improvement Project

CP&L is committed to providing safe, reliable and affordable energy to our customers throughout the Carolinas.

Our studies indicate that the demand from customers in the Pee Dee Region could exceed electric system capability by 2005, potentially creating the types of electric system concerns that have plagued other parts of the country. Additional constraints on the existing electric transmission system in this region, coupled with significant growth in population and electricity usage, have prompted the need for CP&L to enhance its transmission facilities.

To address these concerns, CP&L plans to invest $19.5 million to construct a new 230-kiloVolt transmission line between the Darlington County Power Plant (4030 W. Bobo Newsom Highway) and an existing substation in Florence (1200 N. Douglas St.).

Information Meetings

This public information meeting is designed to provide information about this project and to get your input regarding the issues we should consider when selecting a route for the new line. There are five stations (Project Need, Engineering, Route Alternatives, Environmental Management and Right of Way) with people at each who want to hear from you and are prepared to answer your questions.

Before you leave, please fill out the project questionnaire. That document will help us gather input on local issues related to the routing process. Your responses are important as we plan this critical project.

Project Description

CP&L plans to construct a 32-mile, 230 kiloVolt transmission line to link our Darlington Plant with the Florence substation. (Substations are facilities that contain transformers to reduce the voltage of electricity to a level that can be distributed, ultimately, to homes and businesses.)

The power line will be attached to single-pole transmission structures, spaced approximately every 500 to 700 feet and standing 85-105 feet tall. The right of way, which comes in the form of an easement, allows CP&L representatives access to build and maintain the line.

Benefits to the community

- Provides electricity for continued growth in the area.
- Since transmission grids are interconnected, the upgrades will enhance system reliability for consumers throughout the region, not just CP&L customers.
- Ensures continued economic prosperity for the region. Maintaining a robust system for supplying and delivering electricity is integral in sustaining economic growth.
- Generates an estimated $87,000 in additional annual property tax revenue for local governments.

Land Acquisition

Once a route is selected, CP&L land agents will work individually with property owners to purchase easements for the new line. This line will require 50 feet of right of way on either side of the line (or 100 feet of total right of way). CP&L pays fair market value for easements, and landowners retain ownership of the property with some limitations on use of the right-of-way land.

Schedule

Information meetings: May 21 and May 23, 2002

Route selection: July 2002

Right-of-way acquisition begins: December 2002

Line construction begins: early 2004

New line and substations in service: summer 2005

Public Participation

CP&L is committed to an open public dialogue throughout the line-siting process on this line and all our transmission construction projects. The input received at tonight's meeting will be important as we select a final route for the new line. When the route is selected, we will follow up with residents who join the project mailing list. In addition, more information is available on the CP&L Web site at www.cpl.com. If you have questions about the project, please call us at 1-877-608-9595 and leave your message. Someone from the company will return your call. The S.C. Public Service Commission also may hold a public hearing on this project as part of its review process.

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Darlington - Florence Transmission Improvements Alternate Routes

Darlington - Florence 230kV Transmission Line
Project Questionnaire

This questionnaire is designed to help you identify issues related to the routing of a proposed new 230-kiloVolt (kV) transmission line from the CP&L Darlington County Plant, located at 4030 Bobo Newsome Highway, to an existing CP&L substation at 1200 N. Douglas St. in Florence. Your answers will help the study team understand public interests and concerns, and will allow the team to incorporate this information in the route selection process along with other criteria. Please complete this questionnaire **after** you have reviewed the information presented. Thank you for your input.

PROJECT NEED

1. Do you believe the need for this transmission line has been explained adequately?

_____yes _____no _____uncertain

If "no" or "uncertain," what additional information would be helpful to you?

_____

_____

LINE ROUTING CONSIDERATIONS

2. The routing of a transmission line involves many considerations. Please rank the following factors in the order of their importance to you. Indicate the most important factor with the number 1, second most important with the number 2, and so on, up to the number 13 (the least important factor).

_____ a) Maximize distance from residences
_____ b) Maximize distance from businesses
_____ c) Maximize distance from public facilities (e.g., parks, schools, churches)
_____ d) Maximize distance from historic sites
_____ e) Maximize length along existing transmission lines
_____ f) Maximize length along gas pipelines
_____ g) Maintain reliable electric service
_____ h) Keep costs down
_____ i) Minimize length through wetlands
_____ j) Minimize number of stream / river crossings
_____ k) Minimize length across agricultural land
_____ l) Minimize length across forest land
_____ m) Minimize visibility of the line
_____ n) Minimize total length of line

3. If you would like to comment further on any of the above factors, or identify any other factors or issues that you feel should be considered, please use the space below or the back of this questionnaire.

_____

_____

CP&L

_____

_____

4. If you have a concern with a particular transmission line segment(s) shown on the display of potential routes, please indicate the segment number and describe your concern.

Segment No.	Concern
_____	_____
_____	_____
_____	_____
_____	_____

5. The potential routes follow different types of corridors and across different land uses. Please rate the acceptability of a transmission line in respect to each of the following locations from 1 (preferable) to 3 (least desirable). Circle the appropriate number for each location.

	Preferable	Acceptable	Least Desirable
a. Follow existing gas pipelines	1	2	3
b. Follow existing transmission lines	1	2	3
c. Along a new corridor	1	2	3

ADDITIONAL INFORMATION

6. Which of the following applies to your situation?
   _____ a. Potential line route is near my home.
   _____ b. Potential line route is near my farm or business.
   _____ c. Not affected by potential route.
   _____ d. Other, please specify _____
   _____

7. Do you believe the public open house format and the information provided was helpful for your understanding of the project?

   OPEN HOUSE FORMAT: _____ helpful _____ not helpful
   INFORMATION PROVIDED: _____ helpful _____ not helpful

8. If you would like to know the results of this routing study, please enter your name and address below. (Names and addresses are considered confidential.)

CP&L

Name _____ Phone _____

Address _____

_____

_____

ADDITIONAL COMMENTS OR QUESTIONS:

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--Express Menu--

Darlington, S.C. - Florence, S.C., Transmission Line Construction

As the Pee Dee region continues to grow, CP&L is adding electric generating capacity to help meet the increasing need for power. In addition to those upgrades, CP&L must also enhance our system for transmitting electricity from the generating plants to our substations and ultimately to homes and businesses. CP&L studies indicate that without these enhancements, the current transmission infrastructure would be overloaded by 2005, potentially creating the types of electric system concerns that have plagued other parts of the country.

To address these needs, CP&L proposes to construct a new 230-kilovolt transmission line between the Darlington County Power Plant (4030 W. Bobo Newsom Highway) and an existing substation in Florence (1200 N. Douglas St.).

Project Description
CP&L plans to construct a 32-mile, 230 kilovolt transmission line to link the Darlington Plant with the Florence substation. (Substations are facilities that contain, among other equipment, transformers to reduce the voltage of electricity to a level that can be distributed, ultimately, to homes and businesses.)

The power line will be attached to single-pole transmission structures, spaced approximately every 500 to 700 feet and standing 85-105 feet tall. This project requires acquisition of 100-foot right of way, 50 feet on either side of the line. The right of way, which comes in the form of an easement, allows CP&L representatives access to build and maintain the line.

Maps
To view and print this map, you will need Acrobat Reader. If you don't have this software, you can **download your free copy from Adobe**.

- **Proposed Routes**

Timeline

Information meetings: May 21 and May 23, 2002
Route selection: July 2002
Right-of-way acquisition begins: December 2002

Right of way acquisition begins: December 2002
Line construction begins: early 2004
New line and substations in service: summer 2005

Benefits to the community

- Provides electricity for continued growth in the area.
- Since transmission grids are interconnected, the upgrades will enhance system reliability for consumers throughout the region, not just CP&L customers.
- Ensures continued economic prosperity for the region. Maintaining a robust system for supplying and delivering electricity is integral in sustaining economic growth.
- Generates an estimated $87,000 in additional annual property tax revenue for local governments.

Land Acquisition
Once a route is selected, CP&L land agents will work individually with property owners to purchase easements for the new line. This line will require 50 feet of right of way on either side of the line (or 100 feet of total right of way). CP&L pays fair market value for easements, and landowners retain ownership of the property with some limitations on use of the right-of-way land.

Public Participation
CP&L is committed to limiting impacts on environmental and cultural resources as well as homes and businesses in its siting process. To accomplish that, CP&L needs information from local residents and public participation is critical to the success of the project.

Among other communication initiatives, the company will hold information meetings in May to provide information on the scope and schedule of the project and to gather pertinent information from property owners and others on the proposed routes.

May 21
American Legion Post 13
1752 Harry Byrd Highway (next to the National Guard Armory)
Darlington, SC

May 23
Williams Middle School (Cafeteria)
1119 N. Irby Street
Florence, SC

At these meetings, the company will present detailed maps of the proposed routes for the lines and solicit public input on these alternatives. If you are unable to attend these meetings and would like to submit your

comments, please fill out our **online questionnaire.**

Overhead versus underground
CP&L investigated the possibility of putting the line underground. The reliability of underground transmission lines is a major question across the United States, as relatively few rural underground lines have been constructed. A fault in a buried line, caused by a manufacturing defect or an accidental dig-in, would take much longer to locate and repair than a similar fault in an overhead line. Other adverse factors regarding underground transmission lines are the effects they can have on wetlands and soil erosion and the decreased electrical capacity they can carry. (Please see the **Frequently Asked Questions** section for more information).

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Darlington - Florence 230kv Transmission Line Project Questionnaire

This questionnaire is designed to help you identify issues related to the routing of a proposed new 230-kilovolt (kv) transmission line from the CP&L Darlington County Plant, located at 4030 Bobo Newsome Highway, to an existing CP&L substation at 1200 N. Douglas St. in Florence. Your answers will help the study team understand public interests and concerns, and will allow the team to incorporate this information in the route selection process along with other criteria. Please complete this questionnaire **after** you have reviewed the information presented. Thank you for your input.

This e-mail box is managed Monday - Friday from 8:00 a.m. - 5:00 p.m., except during holidays. Thank you.

1. Required fields are marked with a red asterisk (*).

*Name: _____
Phone: _____
*Address: _____
*City: _____
*State: _____
*Zip: _____
Email: _____

Project Need

2. Do you believe the need for this transmission line has been explained adequately?

○ Yes ○ No ○ Uncertain

If "no" or "uncertain," what additional information would be helpful to you?

Line Routing Considerations

3. The routing of a transmission line involves many considerations. Please rank the following factors in the order of their importance to you. Indicate the most important factor with the number 1, second most important with the number 2, and so on, up to the number 14 (the least important factor).

___ a) Maximize distance from residences
___ b) Maximize distance from businesses
___ c) Maximize distance from public facilities (e.g., parks, schools, churches)
___ d) Maximize distance from historic sites
___ e) Maximize length along existing transmission lines
___ f) Maximize length along gas pipelines
___ g) Maintain reliable electric service
___ h) Keep costs down
___ i) Minimize length through wetlands
___ j) Minimize number of stream / river crossings
___ k) Minimize length across agricultural land
___ l) Minimize length across forest land
___ m) Minimize visibility of the line
___ n) Minimize total length of line

4. If you would like to comment further on any of the above factors, or identify any other factors or issues that you feel should be considered, please use the text box below

factors or issues that you feel should be considered, please use the text box below...

5. If you have a concern with a particular transmission line segment(s) shown on the display of potential routes, please indicate the segment number and describe your concern.

Segment No.	Concern

6. The potential routes follow different types of corridors and across different land uses. Please rate the acceptablility of a transmission line in respect to each of the following locations.

	Preferable	Acceptable	Least Desirable
a. Follow existing gas pipelines	○ Preferable	○ Acceptable	○ Least Desirable
b. Follow existing transmission lines	○ Preferable	○ Acceptable	○ Least Desirable
c. Along a new corridor	○ Preferable	○ Acceptable	○ Least Desirable

Additional Information

7. Which of the following applies to your situation?
   - ○ a. Potential line route is near my home.
   - ○ b. Potential line route is near my farm or business.
   - ○ c. Not affected by potential route.
   - d. Other, please specify:

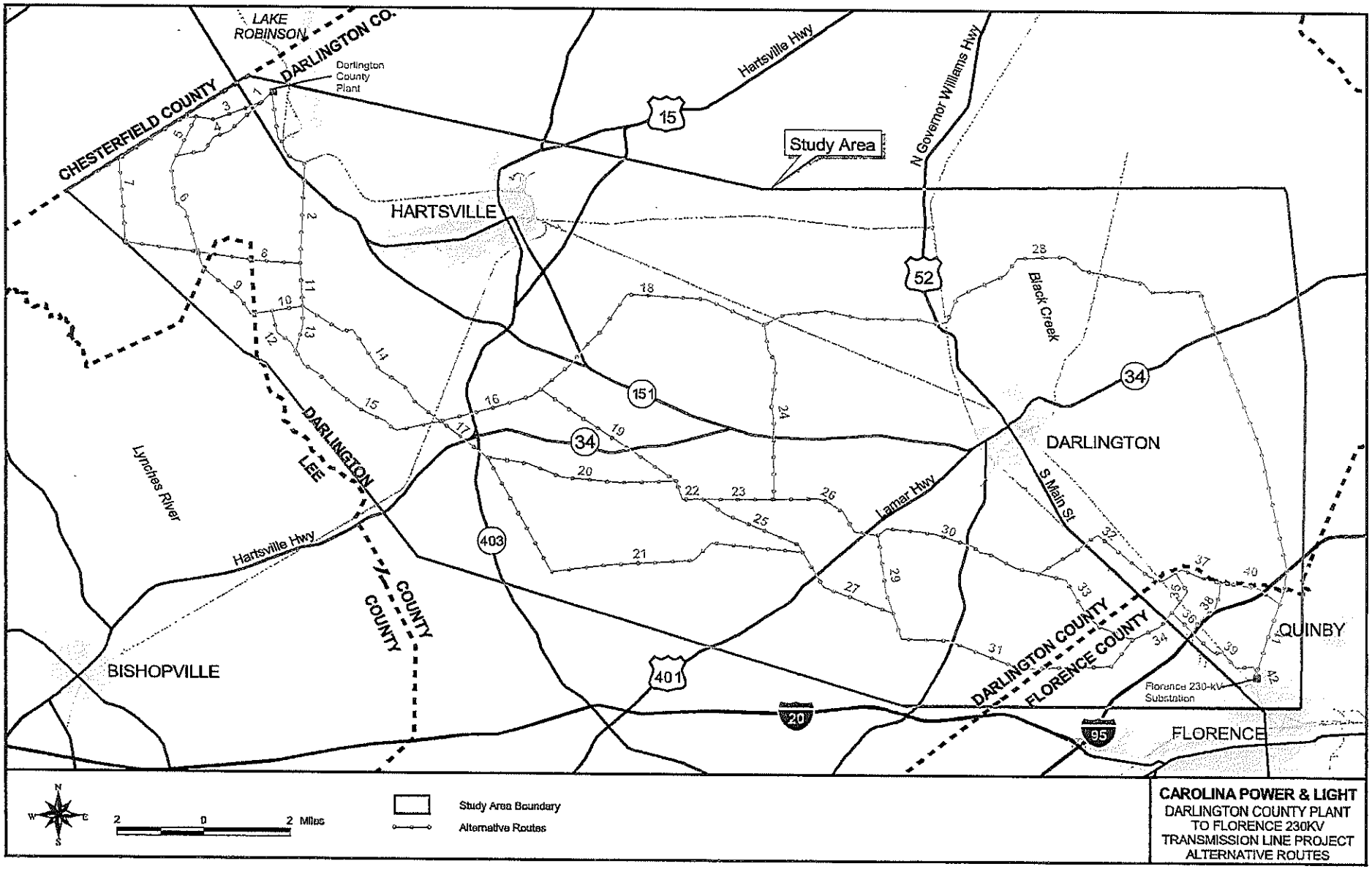
8. Do you believe the public open house format and the information provided was helpful for your understanding of the project?

	Helpful	Not Helpful
Open House Format	○	○
Information Provided	○	○

Additional Comments or Questions:

Submit Reset

Monday Jun. 24, 2002


LAKE ROBINSON
DARLINGTON CO.
Darlington County Plant
CHESTERFIELD COUNTY
Hartsville Hwy
15
Study Area
N Governor Williams Hwy
HARTSVILLE
52
Black Creek
34
151
DARLINGTON
DARLINGTON
LEE
Lynches River
Lamar Hwy
S Main St
Hartsville Hwy
403
COUNTY
COUNTY
BISHOPVILLE
401
DARLINGTON COUNTY
FLORENCE COUNTY
QUINBY
Florence 230-kV Substation
20
95
FLORENCE
N
W
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S
2
0
2 Miles
Study Area Boundary
Alternative Routes
CAROLINA POWER & LIGHT
DARLINGTON COUNTY PLANT
TO FLORENCE 230KV
TRANSMISSION LINE PROJECT
ALTERNATIVE ROUTES

Response Totals
CP&L Darlington County Plant - Florence Transmission Line Project

Total number of questionnaires received from public workshop	34
Total number of questionnaires received via fax, mail, or internet	29
Total number of questionnaires received	63
Number of letters received with or separate from questionnaires	8

PROJECT NEED

1. Do you believe the need for this transmission line has been explained adequately?

Yes	33
No	16
Uncertain	9

If "no" or "uncertain", what additional information would be helpful to you?
Do not understand need (3)
Too close to residences (2)
Why must the line go in this direction cross our property? (2)
Comparison of immediate vs. long-term need and profit need
Construct replacement line to handle additional load compared to building a new line
CP&L not concerned about farmer's fields
CP&L not concerned about wildlife, forestland, farmland, and landowners, only money
Facts / statistics that lead to the decision
Has the Florence and Pee Dee Region been polled regarding unbridled growth?
Mother owns land and was not notified of project
Need explained by grandmother
Notified of meetings by neighbor, and despite being a landowner along proposed routes, never received a questionnaire
Planned housing development and homes for grandchildren planned on land near route
Radiation levels on property (transmission lines combined with microwave towers)
Received no information; informed by word of mouth
Unable to attend workshop, but understand need
What evidence is used to predict future demand?
Who would benefit from the project?
Why is the line not going northeast of Hartsville?
Why must two lines cross our property? Why can't they parallel one another?
Why use farmland?

LINE ROUTING CONSIDERATIONS

2. The routing of a transmission line involves many considerations. Please rank the following factors in the order of their importance to you. Indicate the most important factor with the number 1, second most important with the number 2, and so on, up to the number 13 (the least important factor).

Response Total

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Maximize distance from residences	31	3	3	3	5	1	0	1	1	0	0	1	0	0	49
Maximize distance from businesses	2	3	2	2	4	2	4	3	5	9	1	1	5	2	45
Maximize distance from public facilities (e.g. parks, schools, churches)	3	6	6	2	3	4	3	3	8	1	2	0	0	2	43
Maximize distance from historic sites	2	1	1	3	3	11	1	5	5	3	2	4	2	2	45
Maximize length along existing transmission lines	11	9	8	7	0	1	5	8	1	2	1	0	3	1	57
Maximize length along gas pipelines	2	3	7	4	3	3	8	3	1	2	4	2	0	0	42
Maintain reliable electric service	4	2	0	1	2	4	4	5	2	7	8	3	2	0	44
Keep costs down	2	1	1	1	1	3	3	4	8	2	0	6	4	7	43
Minimize length through wetlands	1	1	1	9	8	0	1	4	2	3	3	8	3	1	45
Minimize number of stream/river crossings	1	2	5	0	1	7	2	2	1	1	6	7	9	2	46
Minimize length across agricultural land	14	19	8	7	3	1	1	0	0	1	3	0	1	0	58
Minimize length across forest land	2	6	2	5	7	1	2	1	2	3	6	2	6	2	47
Minimize visibility of line	4	7	6	3	5	4	6	1	1	6	1	3	1	2	50
Minimize total length of line	1	1	2	2	3	3	1	1	2	2	2	5	12	6	43

Response Total (weighted)

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Maximize distance from residences	434	39	36	33	50	9	0	7	6	0	0	3	0	0	617
Maximize distance from businesses	28	39	24	22	40	18	32	21	30	45	4	3	10	2	318
Maximize distance from public facilities (e.g. parks, schools, churches)	42	78	72	22	30	36	24	21	48	5	8	0	0	2	388
Maximize distance from historic sites	28	13	12	33	30	99	8	35	30	15	8	12	4	2	329
Maximize length along existing transmission lines	154	117	96	77	0	9	40	56	6	10	4	0	6	1	576
Maximize length along gas pipelines	28	39	84	44	30	27	64	21	6	10	16	6	0	0	375
Maintain reliable electric service	56	26	0	11	20	36	32	35	12	35	32	9	4	0	308
Keep costs down	28	13	12	11	10	27	24	28	48	10	0	18	8	7	244
Minimize length through wetlands	14	13	12	99	80	0	8	28	12	15	12	24	6	1	324
Minimize number of stream/river crossings	14	26	60	0	10	63	16	14	6	5	24	21	18	2	279
Minimize length across agricultural land	196	247	96	77	30	9	8	0	0	5	12	0	2	0	682
Minimize length across forest land	28	78	24	55	70	9	16	7	12	15	24	6	12	2	358
Minimize visibility of line	56	91	72	33	50	36	48	7	6	30	4	9	2	2	446
Minimize total length of line	14	13	24	22	30	27	8	7	12	10	8	15	24	6	220

Response Total (sorted)

Factor	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Total
Minimize length across agricultural land	196	247	96	77	30	9	8	0	0	5	12	0	2	0	682
Maximize distance from residences	434	39	36	33	50	9	0	7	6	0	0	3	0	0	617
Maximize length along existing transmission lines	154	117	96	77	0	9	40	56	6	10	4	0	6	1	576
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3. If you would like to comment further on any of the above factors, or identify any other factors or issues that you feel should be considered, please use the space below or the end of this questionnaire.

Category (Number of comments)
Avoid / consider farms / agriculture / irrigation (6)
Use existing lines (4)
Follow property lines / avoid dividing farms (3)
Concerned about distances of proposed routes from residences (3)
Consider future proposed use of land (2)
Consider health / safety hazards (2)
Decreases property values (2)
Avoid industrial land
Consider interference with computers and electronics, specifically avoiding interference for home businesses
Existing line currently crosses property
Health concerns for livestock
Land not for sale at any price
Maximize length along existing CP&L lines by upgrading the lines to carry heavier loads
Maximize length along pipelines if gas companies and CP&L can use the same right-of-way
Minimize the negative effects on the aesthetic value of properties
Double burden when parallelling existing lines
Safety concerns for crop dusters on agricultural fields
Were underground lines considered?

4. If you have a concern with a particular transmission line segment(s) shown on the display of potential routes, please indicate the segment number and describe your concern.

Segment no.	Concern (no. of concerns)
2	Consider the land along this route residential, not agricultural (2) Health risks / concerns (2) Too close to residences (2) Concerned about loss of land to new power lines Power lines currently cross property
9, 10, & 12	Segments cross land for residential development and timber land
11	Segment crosses residential lot and destroys large oak trees
14	Too close to residences (5) Concerns for ability to operate irrigation for farms (3) Avoid or crosses agricultural land (3) Crosses field slated for development (3) Impacts to future plans Land value along Tema Road too high for a transmission line Segment crosses land to be inherited Segment crosses through fields with no consideration of property boundaries Segment is near timber property
16	Children won't be able to build houses on property Crosses in back of property Property value concerns
17	Crosses farm land making farming difficult (3) Property value concerns (2) Too close to residences (2) Center pivot irrigation planned Children won't be able to build houses on property Impacts to future home lots
18	Don't want line on property
21	Crosses farm that has been in the family for generations (2) Disruption of agricultural practices Do not want this route Impacts to land use such as residential development Proposed line located across from planted pine plantation and crop fields
24	Center pivot irrigation planned (2)
27	Impacts for future land use (2) Property value / resale value concerns (2)
27, 29, 30, & 31	Do not want line crossing property Too close to residence
28	Electric Cooperative lines cross property Property value impacts in selling lots Segment crosses pond, dam, wetlands, cemetery, historic sites, and largest white oakstand in the county Segment crosses property and land planned for damming stream
28 & 40	Don't want the line on property Impact future home site Would like an appraisal with and without transmission line
29	Segment interrupts farming practices (2)
30	Property value concerns Too close to residences
31	Family cemetery located along segment (5) Center pivot irrigation planned (2) Crosses agricultural land and near home Place line as close to existing line as possible

32	Place line across from railroad following existing transmission lines (2) Property value concerns for both industrial / commercial property and private property (2) Too close to residences (2) Crosses neighbors agricultural fields Destroy and future type of development Visual impacts Three property owners do not want this segment used
32-40	Last "Green Belt" between Darlington and Florence counties Keep land undisturbed by development
35	Segment crosses planned Technology Park under development by the Florence-Darlington Technical College
	Tower currently near home; why more power lines? Health concerns for humans and livestock

5. The potential routes follow different types of corridors and across different land uses. Please rate the acceptability of a transmission line in respect to each of the following locations from 1 (preferable) to 3 (least desirable). Circle the appropriate number for each location.

	Preferable	Acceptable	Least Desirable
a. Follow existing gas pipelines	38	12	7
b. Follow existing transmission lines	35	8	15
c. Along a new corridor	10	3	42

6. Which of the following applies to your situation?

a. Potential line route is near my home	37
b. Potential line route is near my farm or business	47
c. Not affected by potential route	0
d. Other, please specify	14

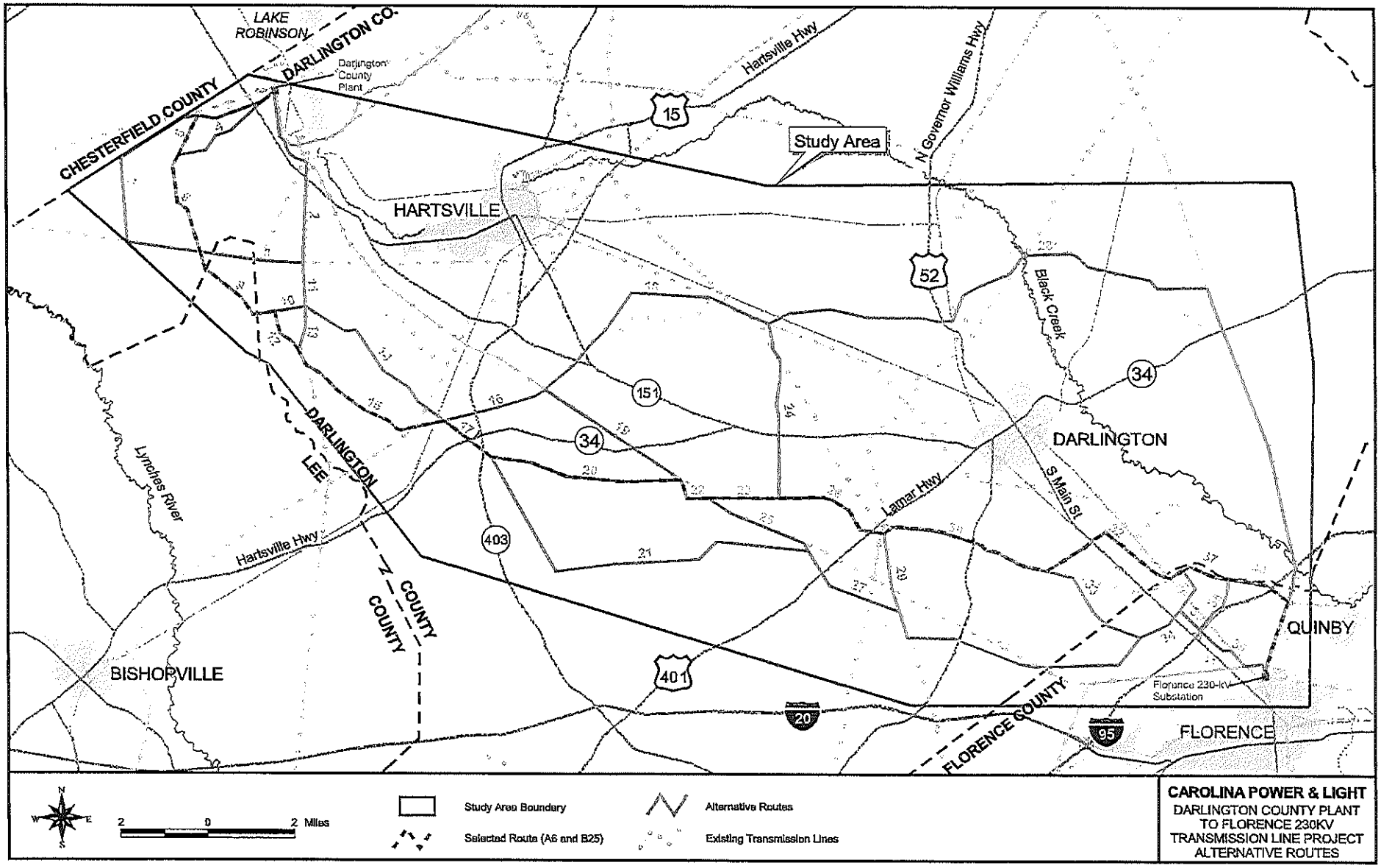
Crosses family cemetery (4)
Crosses farming operations and rented farm land (2)
Decreased property value concerns as land use changes (2)
Crosses college campus under development
Decreased property value
Don't want an additional 230-kV transmission line on property
Enough lines already crossing farm land
Family lives on and farms land crossed by line route
Proposal suggests a new route adding to an existing, highly questionable route

7. Do you believe the public open house format and the information provided was helpful for your understanding of the project?

Open House Format:	
helpful	46
not helpful	2
	Somewhat helpful

Information Provided:	
helpful	38
not helpful	2
	Could not attend open house (3)
	No knowledge of open house (4)
	Group meeting would have been helpful and allowed networking
	Somewhat helpful

Additional comments or questions (from public workshop questionnaire):
Property value / future development / timber value concerns (19)
Too close to residences (9)
Consider farm land / destroys farm land (8)
Interference with farming practices (irrigation, crop dusting) (9)
Avoid using Segment 14 (7)
Visual / aesthetic impacts (7)
Follow existing transmission lines/ gas pipelines (6)
Health concerns (7); long-term exposure to power lines
Lines / gas easement already cross property (5)
Avoid using Segment 32 (4)
Encroachment into last green space between Darlington and Florence counties / preserve green space (3)
Property divided in half by transmission line (3)
Avoid close proximity to Bethea Baptist Nursing Home (2)
Avoid using Segment 21 (2)
CP&L must demonstrate legitimate need (2)
Interference with forest development / pine plantation development (3)
Land has been in the family since the early 1800's / before the American Revolution (2)
Leave farms, woodlands, rivers, streams, and wildlife alone (2)
Only two options at location of Segments 16 and 17 (2)
Representatives were cordial and helpful / thank you (2)
Avoid using Segment 11
Avoid using Segment 15
Avoid using Segment 17
Bad experience with the pipeline company and don't want that experience repeated with CP&L
Can existing (or have existing) routes been considered closer to S.C. 151?
Consider hazards to residents, compensation for land, best route for project, and cost
Consider the historic and cultural resources in Darlington County along Route 52
Consider longevity of the project
Expect top dollar for land
Follow Darlington County and Chesterfield County boundary
Have adjustments been made to the routes prior to the open house to accommodate other land owners?
Heavily impacts Back Swamp Community and will fight any line in our community
Impacts to songbirds and raptors in woods on property
Keep informed on project development
Line should go northeast of Hartsville
Line will destroy land and future plans for land
Maps available are at too large a scale to idenify specific locations
No objection to lines being installed for future power use
Potential loss of planted pines
Project will devastate economic security of family
Routing alternatives do not follow the most direct route from the Darlington County Plant to North Florence
Trespassing / privacy concerns
Use line following the railroad along Segment 32
What is permitted in a condemned area?
Where can the maps used in the open house be acquired?
Why was the I.C. Power Plant not built in Florence instead of having to move power to Florence?
Will there be an opportunity to discuss any other options?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Alternative Routes
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DARLINGTON COUNTY PLANT
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TRANSMISSION LINE PROJECT
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Appendix C
Route Analysis - Raw Scores

Route Analysis-Raw Scores

Z-Scores	Total Length	Length Not Parallel Existing Transmission	Length Not Parallel Gas Pipelines	Residential Proximity Score	Businesses within 200 ft.	Public Facilities within 200 ft.	Cleared / Agricultural Land Crossed	Woodland Crossed	Wetlands Crossed	Perennial Streams Crossed	Visibility Rating	Heavy Angles	TOTAL	Z-Scores
A1	1.0	1.0	-0.6	-0.6	-0.4	0.0	1.5	-0.1	-1.5	0.2	1.6	0.1	2.2	A1
A2	0.9	0.9	1.0	-0.6	-0.4	0.0	1.6	0.7	1.1	-1.5	1.4	-1.1	3.8	A2
A3	1.4	0.8	0.0	-0.6	-0.4	0.0	1.5	0.3	-0.6	0.2	1.9	0.1	4.7	A3
A4	1.5	-0.3	1.0	0.7	-0.4	0.0	0.9	0.6	-0.8	0.2	1.0	-1.7	2.6	A4
A5	1.0	-0.3	2.0	0.7	-0.4	0.0	1.0	1.0	0.8	-1.5	0.5	-2.3	2.4	A5
A6	-0.3	0.8	-1.4	-0.6	-0.4	0.0	-0.9	-0.1	-1.3	1.1	0.0	0.7	-2.4	A6
A7	-0.4	0.7	0.2	-0.6	-0.4	0.0	-0.8	0.7	1.2	-0.7	-0.2	-0.5	-0.8	A7
A8	0.1	0.7	-0.8	-0.6	-0.4	0.0	-0.9	0.3	-0.4	1.1	0.3	0.7	0.1	A8
A9	0.2	-0.5	0.2	0.7	-0.4	0.0	-1.5	0.6	-0.6	1.1	-0.6	0.1	-0.7	A9
A10	-0.3	-0.4	1.1	0.7	-0.4	0.0	-1.4	1.0	1.0	-0.7	-1.2	-0.5	-0.9	A10
A11	-0.4	0.7	-1.5	-1.1	-0.4	0.0	0.0	-0.6	-1.0	1.1	-0.2	1.3	-2.1	A11
A12	-0.5	0.7	0.1	-1.1	-0.4	0.0	0.1	0.2	1.5	-0.7	-0.5	0.1	-0.4	A12
A13	0.0	0.6	-0.9	-1.1	-0.4	0.0	0.0	-0.2	-0.1	1.1	0.1	1.3	0.4	A13
A14	0.1	-0.6	0.1	0.2	-0.4	0.0	-0.6	0.1	-0.3	1.1	-0.8	0.7	-0.4	A14
A15	-0.4	-0.5	1.1	0.2	-0.4	0.0	-0.5	0.5	1.3	-0.7	-1.4	0.1	-0.6	A15
A16	-1.8	-2.2	-1.3	2.0	2.7	0.0	0.1	-2.6	-1.0	0.2	-0.6	0.7	-3.9	A16
A17	-2.2	-2.1	-0.3	2.0	2.7	0.0	0.2	-2.2	0.6	-1.5	-1.2	0.1	-4.1	A17
B1	1.2	-1.1	0.9	-0.2	-1.1	1.3	-0.9	1.3	1.9	0.8	0.2	-1.5	2.8	B1
B2	0.7	-1.0	0.8	0.6	1.4	-0.2	0.6	-0.1	0.8	1.2	0.2	0.4	5.5	B2
B3	0.8	0.2	0.8	0.6	2.1	-0.2	1.5	-0.2	0.7	1.2	0.9	1.9	10.2	B3
B4	0.5	0.3	0.5	0.6	1.4	-0.2	1.4	-0.4	0.5	1.2	0.7	1.7	8.1	B4
B5	0.2	0.4	0.1	1.0	-0.8	-0.2	0.8	-0.3	0.4	1.2	0.9	0.4	4.0	B5
B6	1.1	-0.1	1.3	1.0	-0.8	-0.2	1.3	0.4	1.0	1.2	1.0	0.0	7.1	B6
B7	1.1	0.3	1.2	1.0	-0.1	-0.2	1.4	0.4	0.7	1.2	1.5	0.2	8.7	B7
B8	0.7	1.4	0.6	0.2	-0.4	1.3	0.8	0.8	1.3	1.5	1.1	-0.2	9.2	B8
B9	1.6	1.0	1.8	0.2	-0.4	1.3	1.3	1.6	1.8	1.5	1.2	-0.7	12.3	B9
B10	1.6	1.3	1.7	0.2	0.3	1.3	1.4	1.5	1.6	1.5	1.7	-0.4	13.9	B10
B11	2.6	0.2	2.4	2.9	-1.1	1.3	2.2	1.4	1.7	2.3	2.1	0.2	18.2	B11
B12	-0.7	-2.4	-0.7	0.6	1.4	-0.2	-0.8	-1.4	-0.9	-0.3	-1.6	0.8	-6.3	B12
B13	-0.7	-1.3	-0.7	0.6	2.1	-0.2	0.0	-1.5	-1.0	-0.3	-1.0	2.3	-1.6	B13
B14	-0.9	-1.2	-1.0	0.6	1.4	-0.2	-0.1	-1.7	-1.2	-0.3	-1.2	2.1	-3.7	B14
B15	-1.3	-1.1	-1.4	1.0	-0.8	-0.2	-0.6	-1.7	-1.3	-0.3	-1.0	0.8	-7.8	B15
B16	-0.3	-1.5	-0.2	1.0	-0.8	-0.2	-0.2	-0.9	-0.7	-0.3	-0.8	0.4	-4.7	B16
B17	-0.4	-1.2	-0.3	1.0	-0.1	-0.2	0.0	-1.0	-0.9	-0.3	-0.3	0.6	-3.1	B17
B18	-0.8	0.0	-0.8	0.2	-0.4	1.3	-0.6	-0.5	-0.4	0.0	-0.7	0.2	-2.6	B18
B19	0.2	-0.5	0.3	0.2	-0.4	1.3	-0.2	0.2	0.1	0.0	-0.6	-0.2	0.5	B19
B20	0.1	-0.2	0.2	0.2	0.3	1.3	0.0	0.2	-0.1	0.0	-0.1	0.0	2.0	B20
B21	-1.1	-0.6	-1.2	-0.2	-0.8	1.3	-1.6	-0.5	-0.3	0.0	-1.4	0.0	-6.3	B21
B22	-0.1	-1.0	0.0	-0.2	-0.8	1.3	-1.1	0.3	0.2	0.0	-1.3	-0.4	-3.2	B22
B23	-0.2	-0.7	-0.1	-0.2	-0.1	1.3	-0.9	0.2	0.0	0.0	-0.8	-0.2	-1.6	B23
B24	2.5	1.4	2.2	1.7	-1.1	-0.2	2.3	1.8	1.4	1.5	2.7	-0.7	15.6	B24
B25	-0.9	-1.2	-0.8	-0.6	1.4	-1.7	-0.8	-1.0	-1.2	-1.1	-1.0	0.0	-8.9	B25
B26	-0.8	-0.1	-0.9	-0.6	2.1	-1.7	0.1	-1.1	-1.2	-1.1	-0.3	1.5	-4.2	B26
B27	-1.1	0.0	-1.2	-0.6	1.4	-1.7	0.0	-1.3	-1.4	-1.1	-0.5	1.3	-6.3	B27
B28	-1.4	0.1	-1.5	-0.2	-0.8	-1.7	-0.6	-1.2	-1.5	-1.1	-0.3	0.0	-10.4	B28
B29	-0.4	-0.3	-0.4	-0.2	-0.8	-1.7	-0.2	-0.5	-1.0	-1.1	-0.2	-0.4	-7.2	B29
B30	-0.5	0.0	-0.4	-0.2	-0.1	-1.7	0.0	-0.6	-1.2	-1.1	0.3	-0.2	-5.7	B30
B31	-0.9	1.1	-1.0	-1.0	-0.4	-0.2	-0.6	-0.1	-0.7	-0.7	-0.1	-0.7	-5.2	B31
B32	0.1	0.7	0.2	-1.0	-0.4	-0.2	-0.1	0.6	-0.1	-0.7	0.1	-1.1	-2.0	B32
B33	0.0	1.0	0.1	-1.0	0.3	-0.2	0.0	0.6	-0.3	-0.7	0.5	-0.9	-0.5	B33
B34	-1.2	0.6	-1.3	-1.3	-0.8	-0.2	-1.5	-0.1	-0.6	-0.7	-0.8	-0.9	-8.9	B34
B35	-0.3	0.2	-0.2	-1.3	-0.8	-0.2	-1.1	0.7	0.0	-0.7	-0.7	-1.3	-5.7	B35
B36	-0.3	0.5	-0.3	-1.3	-0.1	-0.2	-0.9	0.6	-0.2	-0.7	-0.2	-1.1	-4.2	B36
B37	-0.9	1.8	-1.0	-1.7	-0.8	-0.2	-1.1	0.7	0.4	-1.1	-0.3	-1.1	-5.2	B37
B38	0.1	1.4	0.2	-1.7	-0.8	-0.2	-0.6	1.4	1.0	-1.1	-0.1	-1.5	-2.1	B38
B39	0.0	1.7	0.1	-1.7	-0.1	-0.2	-0.5	1.3	0.8	-1.1	0.4	-1.3	-0.5	B39

Appendix D
Photographs of Pole Structures

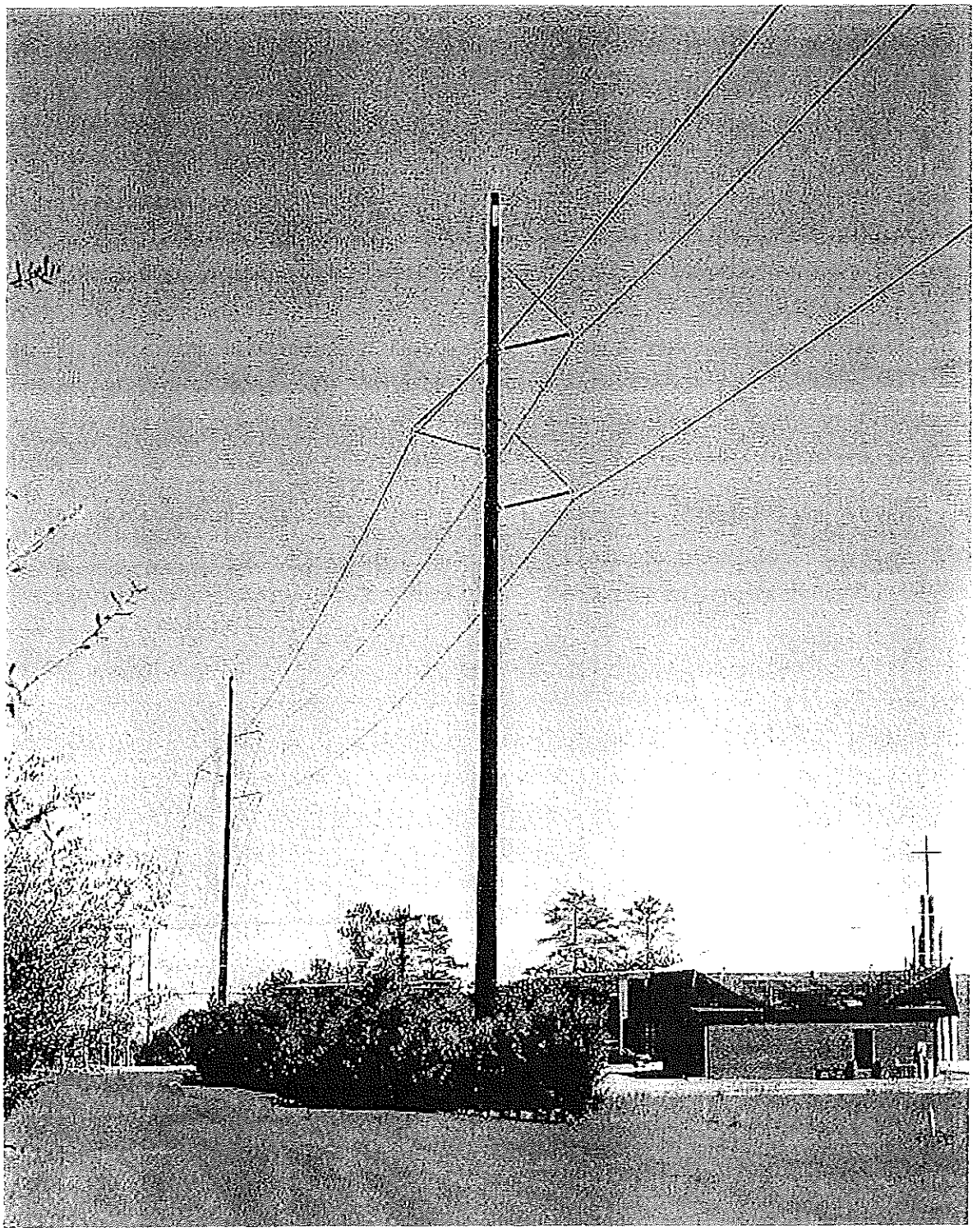

Figure 1. Typical 230-kV weathered steel, single pole structure.

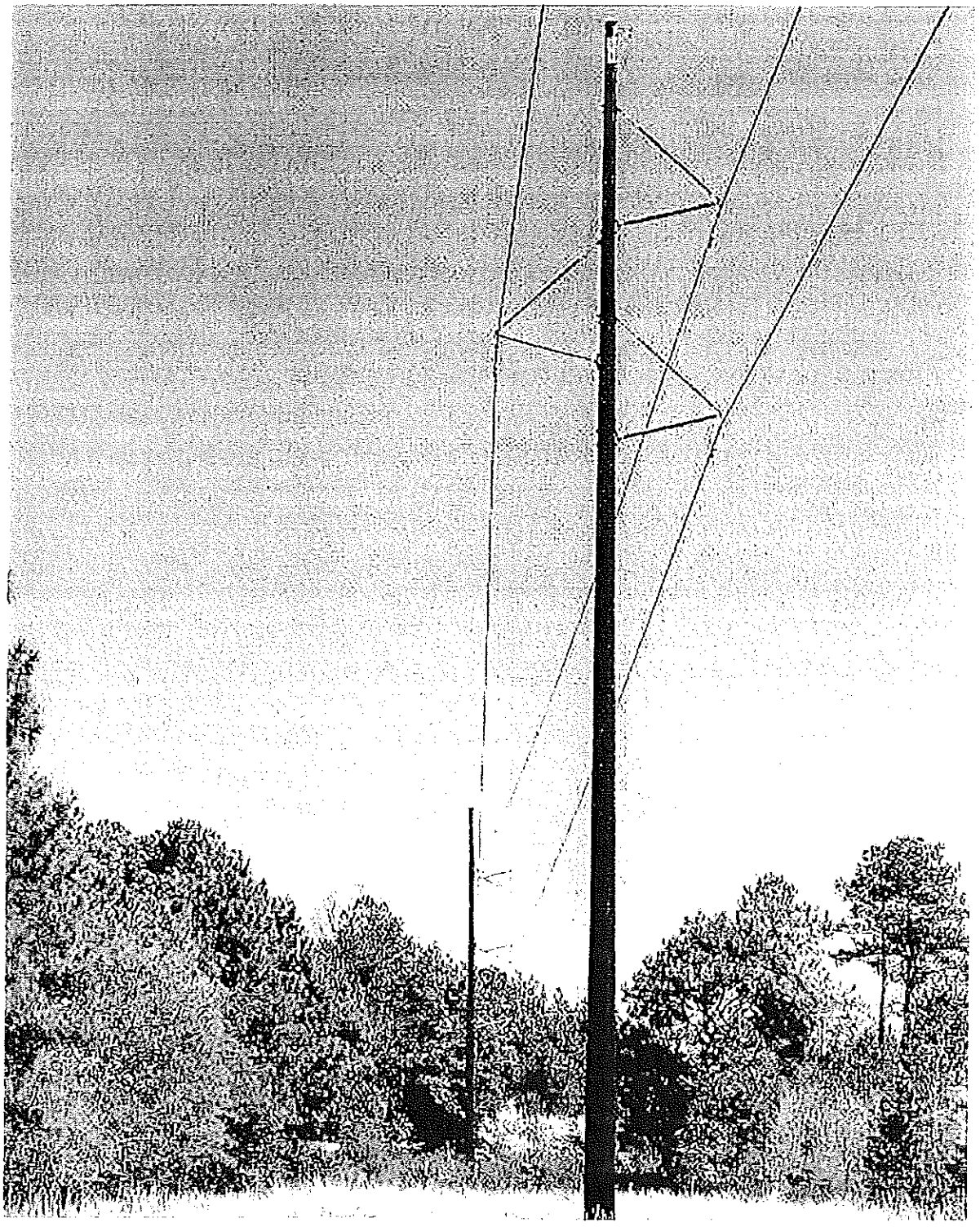

Figure 2. Typical 230-kV weathered steel, single pole structure and angle structure in background.

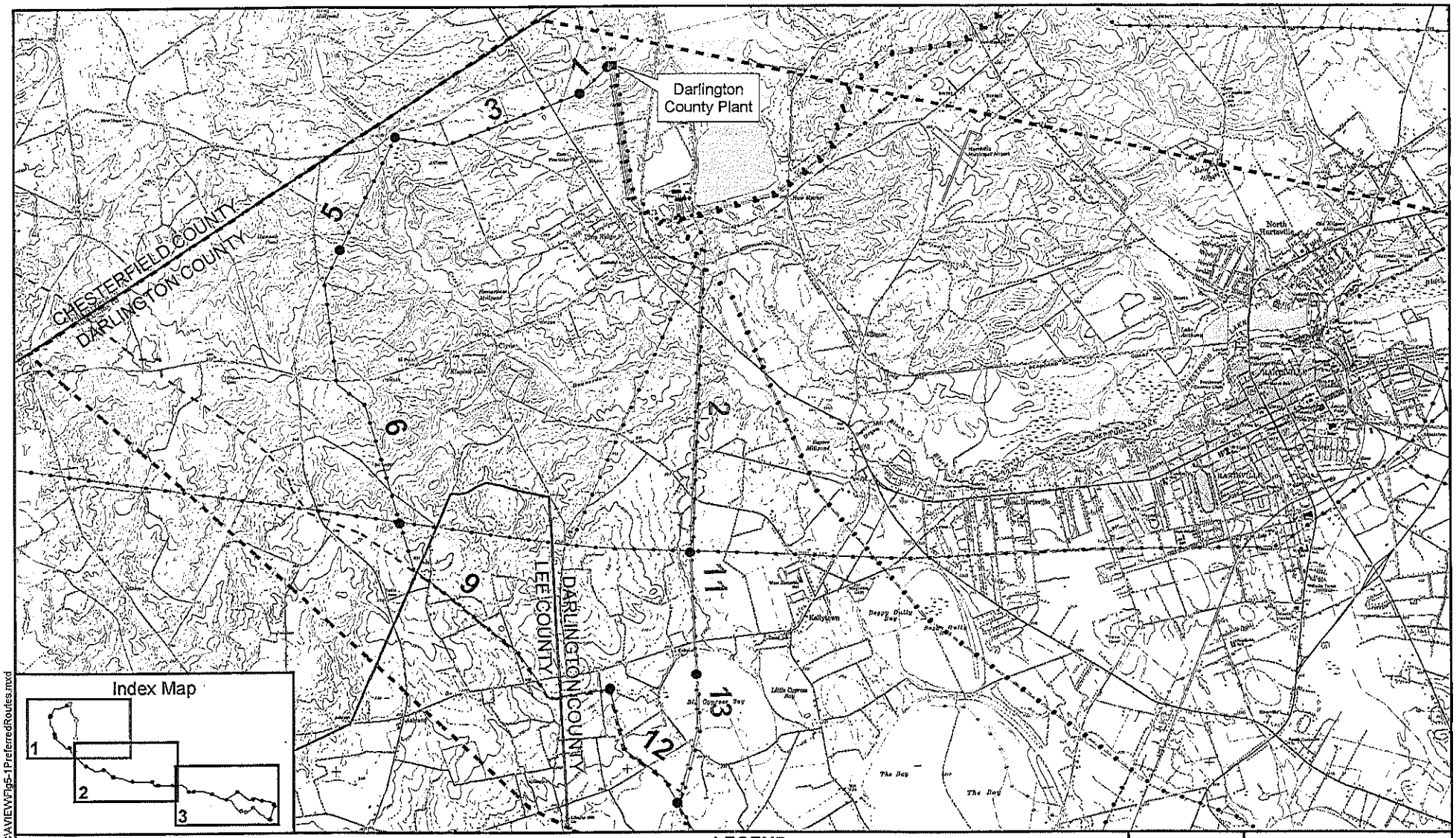

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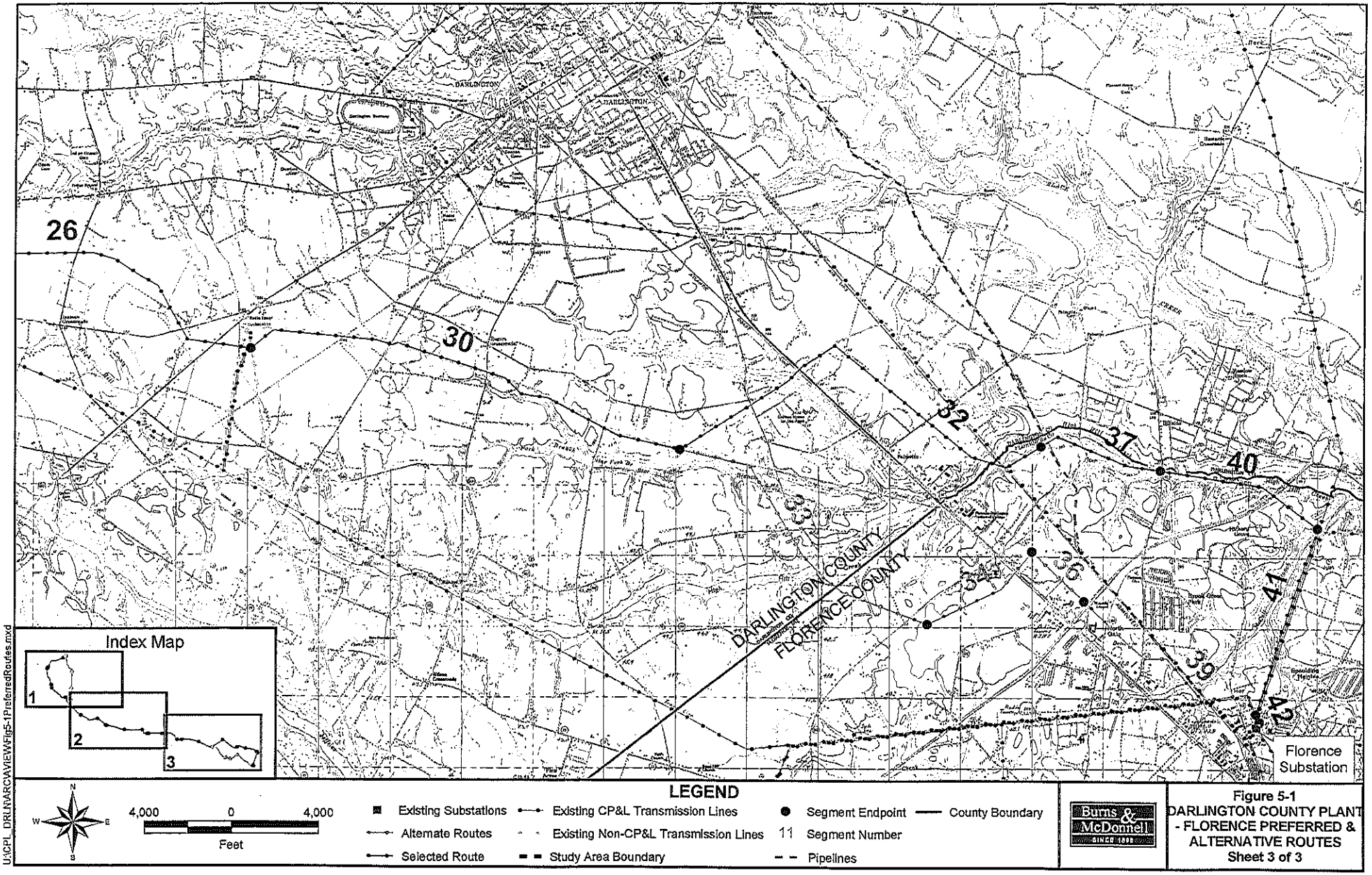
Figure 5-1
DARLINGTON COUNTY PLANT - FLORENCE PREFERRED & ALTERNATIVE ROUTES
Sheet 1 of 3



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Burns & McDonnell SINCE 1898

Figure 5-1
DARLINGTON COUNTY PLANT - FLORENCE PREFERRED & ALTERNATIVE ROUTES
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